VOL. 1059 ... NO. 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

U.S. ... PRINTING OFFICE

Patent ...

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

July 19, 1983 Volume 1032 Number 3

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1032 OG 20
Reissue Applications Filed	1032 OG 20
Request for Reexamination Filed	1032 OG 20
Patent Suits	1032 OG 20
Patent Certificates of Correction	1032 OG 24
Disclaimers	1032 OG 24
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1032 OG 25
Condition of Patent Applications	1032 OG 26
Reexaminations	1032 OG 27
Reissue Patents Granted (31,312)	871
Plant Patents Granted (5,069)	875
Patents Granted	
General and Mechanical (4,393,519)	877
Chemical (4,394,125)	1087
Electrical (4,394,529)	1195
Design Patents Granted (269,729)	1283
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 43
Classification of	
Patents (Including Reissues and Reexaminations)	PI 47
Designs and Plants	PI 50
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 51
Designs and Plants	PI 52
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,152,598, Re. S.N. 498,509, Filed May 26, 1983, Cl. 250/391, LUBRICANT DISTRIBUTION DETERMINATION BY NEUTRON RADIOGRAPHY, Peter A. E. Stewart, Owner of Record: *Rolls-Royce Ltd., London, England,* Attorney or Agent: Roger W. Parkhurst, Ex. Gp.: 256

4,269,543, Re. S.N. 498,574, Filed May 26, 1983, Cl. 405/198, MOBILE, OFFSHORE, SELF-ELEVATING (JACK-UP) UNIT LEG/HULL RIGIDIFICATION SYSTEM, Jerome L. Goldman, et al., Owner of Record: *Friede and Goldman, Ltd., New Orleans, La.,* Attorney or Agent: C. Emmett Pugh, et al., Ex. Gp.: 356

4,303,748, Re. S.N. 476,344, Filed Mar. 17, 1983, Cl. 429/192, ELECTROCHEMICAL GENERATORS FOR PRODUCING CURRENT AND NEW MATERIALS FOR THEIR MANUFACTURE, Michel B. Armand, et al., Owner of Record: *Agence Nationale de Valorisation de la Recherche (Anvar), Neuilly-sur-Seine, France,* Attorney or Agent: Gerard J. Weiser, et al., Ex. Gp.: 111

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Re. 30,926, Reexam. No. 90/000,389, Requested: June 2, 1983, Cl. 73/638, ULTRASONIC INSPECTION, Benjamin J. Ross, et al., Owner of Record: *Republic Steel Corp., Cleveland, Ohio,* Attorney or Agent: Watts, Hoffman, et al., Ex. Gp.: 244, Requester: Owner

3,742,723, Reexam. No. 90/000,398, Requested: June 8, 1983, Cl. 137/315, PIPE FREEZING DEVICE, Frederick G. J. Grise, Owner of Record: *Inventor,* Attorney or Agent: Charles R. Fay, Ex. Gp.: 341, Requester: Sandler & Greenblum, Arlington, Va.

4,301,259, Reexam. No. 90/000,404, Requested: June 13, 1983, Cl. 525/333.1, LINEAR ORGANO CARBONATE COUPLING FOR LIVING POLYMERS OF CONJUGATED DIENES, Joginder Lal, et al., Owner of Record: *Goodyear Tire & Rubber Co., Akron, Ohio,* Attorney or Agent: J. Y. Clowney, Ex. Gp.: 144, Requester: Michelin & Cie, Ferrand Cedex, France

4,332,536, Reexam. No. 90/000,391, Requested: June 3, 1983, Cl. 425/033, HYDRAULIC TIRE PRESS Anand P. Singh, et al., Owner of Record: *NRM Corp., Akron, Ohio,* Attorney or Agent: Maky, Renner, et al., Ex. Gp.: 147, Requester: c/o Joseph Spivak, Washington, D.C.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,122,474, Hoffman-La Roche, Inc., CHLORDIAZEPOXIDE AND CLIDINIUM HALIDE COMPOSITION AND METHOD OF USING SAME, **filed** Feb. 18, 1982, D.C.N.J. (Newark), Doc. 82-483, *Hoffman-La Roche, Inc., et al.* v. *Bolar Pharmaceutical Co., Inc., et al.* Consent order for preliminary injunction and terminating action administratively filed Mar. 17, 1982.

3,365,800, Richard F. Carella, ARCHERY BOW SIGHT ASSEMBLY; **4,328,625, same,** ARCHERY BOWSIGHT (BETWEEN RANGE), **filed** Mar. 30, 1983, D.C., E.D. Mich. (Bay City), Doc. 83 CV 9036 PH, *Richard F. Carella* v. *Target Sales, Co., et al.*

3,409,579, Ashland Oil, Inc., FOUNDRY BINDER COMPOSITION COMPRISING BENZYLIC ETHER RESIN, POLYISOCYANATE, AND TERTIARY AMINE; **3,676,392, same,** RESIN COMPOSITIONS, **filed** Mar. 4, 1983, D.C., E.D. Mich. (Detroit), Doc. 83CV0806DT, *Ashland Oil, Inc.* v. *Delta Resins & Refractories, Inc.*

3,425,779, Paul C. Fisher, PRESSURIZED MARKING INSTRUMENT, **filed** Apr. 19, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 2456, *Paul C. Fisher* v. *Sears Roebuck and Co.*

3,430,221, Barringer Research Ltd., PROXIMITY DETECTOR, **filed** July 9, 1980, D.C., W.D. Pa. (Pittsburgh), Doc. 80-925, *Federal Laboratories, Inc.* v. *Barringer Research Ltd., et al.* Defendant is the owner of

Pat. No. 3,430,221 which is valid and subsisting. Consent Decree filed May 2, 1983.

3,465,441, Leonard I. Linkow, RING-TYPE IMPLANT FOR ARTIFICIAL TEETH, **filed** Apr. 11, 1983, D.C.N.J. (Newark), Doc. 83-1242 L, *Oratronics, Inc.* v. *Leonard I. Linkow.*

3,479,840, Dana Corp., TRUNNION SEAL FOR CARDAN-TYPE UNIVERSAL JOINT, **filed** Mar. 30, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 2248, *Dana Corp.* v. *Precision Universal Joint Corp.*

3,480,504, Good and Morgan, AUTOMATIC APPARATUS FOR APPLYING COVERS TO BIOLOGICAL SLIDES, **filed** Jan. 10, 1983, D.C. Minn. (Minneapolis), Doc. 4-83 Civil 35, *Rose M. Morgan and Dorothy I. Good* v. *Gibbco Scientific, Inc., et al.* Stipulation and Order of Dismissal without prejudice dated Mar. 30, 1983.

3,501,611, Paul Opprecht, ELECTRODE ROLL FOR WELDING MACHINES; **3,743,813, same,** METHOD FOR AUTOMATIC MANUFACTURE OF METAL CONTAINER BODIES, AND WELDING MACHINES FOR APPLICATION THEREOF; **3,745,295, same,** METHOD FOR AUTOMATIC MANUFACTURE OF METAL CONTAINER BODIES, AND WELDING MACHINE FOR APPLICATION THEREOF; **4,160,892, same,** METHOD AND APPARATUS FOR SEAM WELDING OVERLAPPED EDGES, **filed** May 11, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 2938, *Paul Opprecht* v. *Fuji Kogyosho Co.*

3,620,650, Robert F. Shaw, GAS-DISABLED LIQUID PUMPING APPARATUS, **filed** Mar. 15, 1983, D.C., N.D. Calif. (San Francisco), Doc. C83 1252 WAI, *Oximetrix, Inc.* v. *Robert F. Shaw, et al.*

3,659,112, Caterpillar Tractor Co., MASTER LINK FOR CUSHIONED TRACK, **filed** Mar. 18, 1983, D.C., C.D. Ill. (Peoria), Doc. 83-1066, *Caterpillar Tractor Co.* v. *Intertractor, Viehmann & Co.*

3,676,392. (See 3,409,579.)

3,702,484, Aqua Therm Products Corp., LIGHTWEIGHT, MINIMUM-VOLUME WATER PAD, **filed** Feb. 16, 1982, D.C., N.D.N.Y. (Utica), Doc. 82-CV-161, *Aqua Therm Products Corp.* v. *Akros Mfg., Inc., et al.* Stipulated Order of Dismissal of Action under Rule 41(a)(1)(ii) filed Apr. 18, 1983.

3,712,357, Belts, Bolts, Cups, Corp., BOLT FOR ATTACHING ELEVATOR BUCKETS TO BELTS, AND METHOD OF MAKING SAME, **filed** Mar. 3, 1983, D.C., N.D. Ga. (Atlanta), Doc. C83-593A, *Belts, Bolts, Cups, Corp.* v. *Maxi-Lift, Inc.*

3,743,813. (See 3,501,611.)

3,745,295. (See 3,501,611.)

3,748,997, Tempmaster Corp., ACOUSTICAL INSULATED FAN AND TEMPERATURE CONDITIONING PENTHOUSE UNIT, **filed** May 4, 1983, D.C. Ak. (Anchorage), Doc. A83-237, *Tempmaster Corp.* v. *Mark Hot, Inc., et al.*

3,754,309, Kennametal, Inc., CUTTING INSERT AND CLAMPING ARRANGEMENT THEREFOR, **filed** Feb. 8, 1980, D.C., W.D. Mich. (Grand Rapids), Doc. G80-91 CA1, *Kennametal, Inc.* v. *Spec Tool Co., Inc.* Plaintiff is the owner of Pat. No. 3,754,309, which is good and valid at law. Defendant is permanently enjoined from further infringing Plaintiff's patent. Final Judgment filed Apr. 27, 1983.

3,782,708, Kuhlman Corp., SPRING ASSEMBLY AND METHODS AND MACHINES FOR THE MANUFACTURE THEREOF; **3,866,287, same,** METHODS FOR THE MANUFACTURE OF SPRING ASSEMBLIES, **filed** Apr. 13, 1983, D.C., E.D. Mich. (Detroit), Doc. 83CV134D9T, *Kuhlman Corp.* v. *Peterson American Corp.*

3,825,129, Don D. Beck, PIPE HANDLING APPARATUS; **4,099,630, same, filed** June 30, 1980, D.C., W.D. Okla. (Oklahoma City), Doc. C-80-773-T, *Don D. Beck* v. *Briscoe Black Gold, Inc., et al.* Plaintiff is the owner of Pat. Nos. 3,825,129 and 4,099,630 which are good and valid. Judgment against defendant filed Mar. 2, 1983.

3,825,229, Construction Specialties, Inc., COMBINATION HANDRAIL AND WALL PROTECTOR; **3,861,110, same,** BUMPER GUARD; **4,196,552, same,** CRASH RAIL; **4,200,261, same,** HANDRAIL AND CRASH RAIL, **filed** Jan. 5, 1982, D.C. Kans. (Wichita), Doc. 82-1013, *Construction Specialties, Inc.* v. *Balco, Inc.*

3,861,110. (See 3,825,229.)

3,865,452, Industrial Electronic Hardware Corp., SPARK GAP PROTECTION IN CATHODE RAY TUBE SOCKETS, **filed** Feb. 1, 1978, D.C., N.D. Ill. (Chicago), Doc. 78 C 361, *Industrial Electronic Hardware Corp.* v. *American Plasticraft Co.* On Stipulation, complaint and counterclaim dismissed with prejudice, per Order dated Feb. 14, 1979.

3,866,287. (See 3,782,708.)

3,875,719, Troy Steel Corp., METAL SUPPORT FOR WOOD STRUCTURAL ELEMENTS, **filed** Nov. 17, 1978, D.C. Minn. (St. Paul), Doc. 2-78-435, *Troy Steel Corp.* v. *United Steel Products Co.* **Same, filed** July 27, 1979, D.C., E.D. Mich. (Detroit), Doc. 972982, *Troy Steel Corp.* v. *Gordon Machinery Co.*

3,876,579, Rexnord, Inc., COMPOSITION TO BE APPLIED TO A SURFACE TO INCREASE ITS WEAR RESISTANCE, **filed** Aug. 8, 1980, D.C., N.D., Ill. (Chicago), Doc. 80 C 4229, *Rexnord, Inc.* v. *Polygem, Inc.* Consent Decree permanently enjoining and restraining defendants from further infringing Pat. No. 3,876,579 filed May 4, 1983.

3,879,825, B & J Mfg. Co., TIRE BUFFING MACHINE BLADES, **filed** Apr. 22, 1983, D.C., N.D. Ohio (Cleveland), Doc. C83-1731, *B & J Mfg. Co.* v. *D. A. Frost Industries, Inc., et al.*

3,890,975, Ethicon, Inc., CONTROLLED RELEASE SUTURE, **filed** May 21, 1976, D.C., S.D.N.Y., Doc. 76-CIV-2301, *American Cyanamid Co.* v. *Ethicon, Inc.* Defendant has judgment against Plaintiff, dismissing the complaint, per judgment filed June 17, 1977.

3,895,312, Systron Donner Corp., LOW NOISE HIGH SPECTRAL PURITY MICROWAVE FREQUENCY SYNTHESIZER, **filed** Mar. 23, 1983, D.C., N.D. Calif. (San Francisco), Doc. 83-1396 WAI, *Systron Donner Corp., et al.* v. *Gigatronics, Inc., et al.*

3,920,075, Texas Iron Works, Inc., METHOD FOR POSITIONING A LINER ON A TUBULAR MEMBER IN A WELL BORE WITH A RETRIEVABLE PACK OFF BUSHING THEREBETWEEN, **filed** Mar. 20, 1979, D.C., S.D. Tex. (Houston), Doc. H-79-581, *Texas Iron Works, Inc.* v. *Brown Oil Tools, Inc.*

3,923,301, Dwight L. Myers, AMUSEMENT WATER SLIDE AND METHOD, **filed** Dec. 21, 1978, D.C., M.D.N.C. (Greensboro), Doc. C-78-659-S, *United States of America* v. *Dwight L. Myers.* Action voluntarily dismissed without prejudice by Plaintiff on Feb. 15, 1979.

3,944,760, CTS CORP., SWITCH ASSEMBLY HAVING SLIDER ACTUATOR INSULATING PLATE INSERTED BETWEEN NORMALLY CLOSED CONTACTS, **filed** Apr. 28, 1982, D.C., N.D. Calif. (San Jose), Doc. 82-1850, *CTS Corp.* v. *Stanford Applied Engineering, Inc.* Case dismissed without prejudice and without costs on Mar. 25, 1983.

3,969,780, James M. Henderson, CONTINUOUS CARPET DYEING PROCESS, **filed** Nov. 9, 1979, D.C., N.D. Ga. (Rome), Doc. C79-236R, *United Merchants and Manufacturers, Inc.* v. *James M. Henderson.*

3,978,531, Bengt Erland Ilon, LIFTING DEVICE, **filed** Feb. 15, 1977, D.C. District of Columbia (Wash. D.C.), Doc. 77-0281, *Labarge, Inc.* v. *Bengt Erland Ilon, et al.* Stipulation and Order dismissing action, including without limitation all claims with prejudice, filed May 18, 1978.

3,995,498, Nortron Corp., WHEEL MOUNTING ASSEMBLY FOR TIRE BALANCING MACHINE; **4,352,291, same,** BALANCING MACHINE, **filed** Apr. 26, 1983, D.C., N.D. Calif. (San Francisco), Doc. C-83-2096 TEH, *Nortron Corp.* v. *Dynabal Corp., et al.*

4,024,734, Trip-Lite Ltd., YARN FAULT DETECTORS; **D. 246,292, same,** YARN FAULT DETECTOR, **filed** Aug. 9, 1982, D.C., N.D.N.Y. (Utica), Doc. 82-CV-825, *Trip-Lite Ltd., et al.* v. *Kencap Products, Inc.* Final Judgment on Consent filed Feb. 8, 1983.

4,048,573, McIntosh Laboratory, Inc., AMPLIFIER IMPROVEMENTS FOR LIMITING CLIPPING, **filed** Apr. 13, 1983, D.C., W.D. Wash. (Seattle), Doc. C83-508M, *McIntosh Laboratory, Inc.* v. *Carver Corp.*

4,052,775, Irvin Industries, Inc., SAFETY SEAT BELT BUCKLE, **filed** Nov. 18, 1977, D.C. Del. (Wilmington), Doc. 77-453, *Irvin Industries, Inc.* v. *Gateway Industries, Inc.* Stipulation and Order dismissing case with prejudice filed July 2, 1979.

4,061,788, Malcolm R. Wommack, WORM DETECTION PROCESS, **filed** Nov. 7, 1979, D.C., N.D. Tex. (Fort Worth), Doc. CA4-79-391K, *Malcolm R. Wommack* v. *Durham Pecan Co., Inc.*

4,072,230, L. K. Van Keuren Co., Inc., ASSEMBLY FOR SUPPORTING DELICATE EQUIPMENT DURING SHIPPING, **filed** Sept. 14, 1981, D.C., N.D.N.Y. (Utica), Doc. 81-CV-977, *L. K. Van Keuren Co., Inc.* v. *Central Packaging Supply, Inc.* Case dismissed at call of dismissal calendar on Mar. 25, 1983.

4,072,309, Jerry Lee Wilson, MULTI-PURPOSE EXERCISE DEVICE, **filed** July 21, 1982, D.C., N.D. Ohio (Cleveland), Doc. C82-1883A, *Jerry Lee Wilson, et al.* v. *Contractor Equipment Mfg., Inc., et al.*

4,099,630. (See 3,825,129.)

4,099,658, John A. Bott, ARTICLE CARRIER FOR AUTOMOTIVE VEHICLES, **filed** May 8, 1979, D.C., E.D. Mich. (Detroit), Doc. 79-71438, *John A. Bott* v. *Four Star Corp.* Defendant is permanently enjoined from further infringing Plaintiff's patent. Judgment filed Apr. 27, 1983.

4,105,017, Electro-Biology, Inc., MODIFICATION OF THE GROWTH, REPAIR AND MAINTENANCE BEHAVIOR OF LIVING TISSUE AND CELLS BY SPECIFIC AND SELECTIVE CHANGE IN ELECTRICAL ENVIRONMENT; **4,266,532, same,** MODIFICATION OF THE GROWTH, REPAIR AND MAINTENANCE BEHAVIOR OF LIVING TISSUES AND CELLS BY SPECIFIC AND SELECTIVE CHANGE IN ELECTRICAL ENVIRONMENT; **4,266,533, same,** MODIFICATION OF THE GROWTH, REPAIR AND MAINTENANCE BEHAVIOR OF LIVING TISSUES AND CELLS BY A SPECIFIC AND SELECTIVE CHANGE IN ELECTRICAL ENVIRONMENT; **4,315,503, same,** MODIFICATION OF THE GROWTH, REPAIR AND MAINTENANCE BEHAVIOR OF LIVING TISSUES AND CELLS BY SPECIFIC AND SELECTIVE CHANGE IN ELECTRICAL ENVIRONMENT, **filed** Apr. 8, 1983, D.C., S.D.N.Y., Doc. 83-CIV-2718, *Telectronics Proprietary Ltd.* v. *Electro-Biology, Inc.*

4,111,477, Paul D. Rigali, WINDOW GUARD RELEASE, **filed** May 24, 1982, D.C., C.D. Calif. (Los Angeles), Doc. CV-82-2559, *Paul D. Rigali* v. *Los Alimitos Ornamental Castings, Inc.* Court dismissed action for failure to comply with pretrial rules and for failure to appear on Mar. 31, 1983.

4,138,186, Everett/Charles, Inc., TEST APPARATUS, **filed** May 8, 1981, D.C., W.D. Va. (Harrisonburg), Doc. 81-0066 (H), *Everett/Charles, Inc., et al.* v. *World Enterprises, Inc.* Stipulation of Dismissal with prejudice filed Apr. 6, 1983.

4,160,336, Query and Query, METHOD FOR TREATING FIREANTS, **filed** Apr. 15, 1983, D.C.S.C. (Charleston), Doc. 83-0917-1, *Grady W. Query and O. Grady Query* v. *Whitmire Research Labs, Inc., et al.*

4,160,892. (See 3,501,611.)

4,181,409, American Optical Corp., ASPHERIC LENS SERIES, **filed** July 24, 1981, D.C., M.D. Fla. (Tampa), Doc. 81-700 Civ T H, *American Optical Corp.* v. *Essilor International (Compagnie Generale D'Optique) S.A., et al.*

4,196,552. (See 3,825,229.)

4,200,261. (See 3,825,229.)

4,212,335, Anthony J. Bova, WATERBED FILLING UNIT, **filed** Apr. 7, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 2206, *Anthony J. Bova* v. *Waterworth.*

4,214,658, Simple Pleasures, Inc., SMOKING SYSTEM, **filed** Apr. 5, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 2372, *Simple Pleasures, Inc., et al.* v. *Paul Singh, doing business as Peacock.*

4,217,473, W. H. Brady Co., CONNECTING FLEXIBLE SWITCH; **4,218,600, same, filed** Jan. 3, 1983, D.C., N.D. Ill. (Chicago), Doc. 83C0020, *W. H. Brady Co.* v. *Carl Gorr Printing Co.* Plaintiff is the owner of Pat. Nos. 4,217,473 and 4,218,600 which are valid and have been infringed by defendant. Defendant is enjoined from further infringing Plaintiff's patents. Filed Apr. 25, 1983.

4,218,600. (See 4,217,473.)

4,254,452, Gary P. Switala, LIGHTED TRAY APPARATUS, **filed** Apr. 5, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 2359, *Laminite Plastics Corp.* v. *Gary P. Switala, doing business as G.P.S. Manufacturer.*

4,264,892, Lincoln M. Zonn, ALARM DEVICE, **filed** Dec. 15, 1982, D.C., N.D. Calif. (San Francisco), Doc. C82 6789 EFL, *Lincoln M. Zonn and Brian P. Lewis* v. *Tandy Corp., et al.* Stipulation and Order for Dismissal with prejudice filed Apr. 20, 1983.

4,266,532. (See 4,105,017.)

4,266,533. (See 4,105,017.)

4,267,751, Lynn J. Ziegelmeyer, SAW CHAIN DEPTH-GRINDING APPARATUS, **filed** Mar. 24, 1983, D.C. Ore. (Portland), Doc. 83-444, *Lynn J. Ziegelmeyer* v. *Elmer R. Silvey, et al., doing business as Silvey Precision Chain Grinders.*

4,287,993, Vito Licari, ADJUSTABLE RACK FOR HANGING ARTICLES, **filed** May 7, 1982, D.C.N.J. (Newark), Doc. 82-1449, *Basic Line, Inc.* v. *K-Del Corp.* Order of Dismissal of action filed Mar. 24, 1983.

4,300,287, Larry T. Tibbs, CUTTING TOOL, **filed** Apr. 7, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 2413, *Larry T. Tibbs, et al.* v. *Gerald Wivins, doing business as Wivco Tool Design Ltd., et al.*

4,313,485, BSL Corp., TRANSPARENT ACCESS CURTAIN FOR COOLERS AND THE LIKE, **filed** May 27, 1982, D.C., W.D.N.Y. (Buffalo), Doc. 82-462E, *BSL Corp.* v. *Fredrick's Equipment Service, Inc.* **Same, filed** Mar. 24, 1983, D.C., N.D. Calif. (San Francisco), Doc. 83-1400 WAI, *BSL Corp.* v. *Necor Corp.*

4,315,503. (See 4,105,017.)

4,321,038, Van R Dental Products, Inc., BRAIDED GINGIVAL RETRACTION CORD, **filed** Apr. 26, 1983, D.C., W.D. Wash. (Seattle), Doc. C83-573M, *Van R Dental Products, Inc.* v. *Pascal Co., Inc.*

4,322,827, Lowrance Electronics, Inc., RANGE EXPANDER FOR SONAR SYSTEM, **filed** Mar. 29, 1983, D.C., N.D. Okla. (Tulsa), Doc. 83-C-272-E, *Lowrance Electronics, Inc.* v. *Techsonics, Inc.*

4,328,625. (See 3,365,800.)

4,343,032, Cable Electric Products, Inc., LIGHT SENSITIVE ELECTRICAL DEVICE, **filed** Mar. 7, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 1357, *Cable Electric Products, Inc.* v. *Home Equipment Mfg. Co.*

4,348,158, Smith & Loveless, Inc., SEWAGE PUMPING STATION, **filed** Apr. 29, 1983, D.C., W.D. Wis. (Madison), Doc. 83-C-410-C, *Smith & Loveless, Inc.* v. *Usemco, Inc.*

4,352,291. (See 3,995,498.)

4,355,210, Midian Electronics, Inc., SUB-MINIATURE TONE ENCODER WITH AUTOMATIC NUMBER IDENTIFICATION, **filed** Oct. 19, 1982, D.C., N.D. Calif. (San Francisco), Doc. C-82-5772-RFP, *Midian Electronics, Inc.* v. *Norcomm Corp.* Stipulation to dismiss with prejudice filed May 10, 1983.

4,369,959, William M. Hornbuckle, SHEET FEED MACHINE, **filed** Apr. 7, 1983, D.C., N.D. Okla. (Tulsa), Doc. 83-C-307-E, *William M. Hornbuckle* v. *Sandco, Inc.*

4,372,593, David A. Kesselman, TAMPER INDICATOR, **filed** Apr. 6, 1983, D.C.N.J. (Newark), Doc. 83-1221, *David A. Kesselman* v. *E. J. Brooks Co., Inc.*

Re. 29,114, James H. McQuestion, BURIAL VAULT, **filed** June 19, 1978, D.C., E.D. Ill. (Danville), Doc. 78-0087-D, *James H. McQuestion* v. *David L. Darby, et al., doing business as Greenland Plastics Co.*

Re. 29,487, Cabot Corp., EARPLUGS, **filed** Mar. 3, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 1289, *Moldex/Metric Products, Inc.* v. *Cabot Corp.*

Re. 30,613, Matsuzaka Iron Works, Inc., SHEARING TOOL FOR SYNTHETIC RESIN TUBES; **D. 252,666, same,** VINYL PIPE CUTTER, **filed** Mar. 28, 1983, D.C., N.D. Ohio (Youngstown), Doc. C83-1328Y, *Wheeler Mfg. Corp.* v. *Matsuzaka Iron Works, Inc.*

D. 246,292. (See 4,024,734.)

D. 252,666. (See Re. 30,613.)

D. 253,752, Cincinnati Microwave, Inc., RADAR WARNING RECEIVER, **filed** Feb. 15, 1983, D.C., S.D. Ohio (Dayton), Doc. C-3-83-139, *Cincinnati Microwave, Inc.* v. *Larrick's, Inc.* Case transferred to the N.D. Ill. on May 13, 1983.

D. 254,186, The Colber Corp., RESISTOR HOUSING, **filed** Oct. 4, 1982, D.C., E.D. Tenn. (Chattanooga), Doc. Civ-1-82-447, *The Colber Corp.* v. *D. M. Steward Mfg. Co.* Plaintiff is the owner of D. 254,186. Defendant is permanently enjoined against further infringing Plaintiff's patent. Filed Apr. 28, 1983.

D. 256,802, Cagles, Inc., EVISCERATOR TOOL, **filed** Feb. 12, 1982, D.C., N.D. Ga. (Gainesville), Doc. C82-027G, *Cagles, Inc.* v. *Centennial Machine Co., Inc.* Consent stipulation of dismissal filed Jan. 18, 1983.

D. 260,624, John J. Madison Co., Inc., FIGURINE OF AN ANTELOPE; **D. 261,375, same,** FIGURINE OF A OKAPI; **D. 261,490, same,** FIGURINE OF A BASSET HOUND; **D. 262,007, same,** FIGURINE OF A DUCK, **filed** Apr. 18, 1983, D.C., S.D.N.Y., Doc. 83-CIV-2955, *John J. Madison Co., Inc.* v. *Benrose Lamp Co., Inc.*

D. 261,096, Petersen Mfg. Co., Inc., HAND TOOL, **filed** Nov. 2, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 5667, *Petersen Mfg. Co., Inc.* v. *Central Purchasing, Inc., doing business as Harbor Freight Salvage Co., et al.* Plaintiff's D. 261,096 is invalid and unenforceable, per order filed Apr. 18, 1983.

D. 261,375. (See D. 260,624.)

D. 261,490. (See D. 260,624.)

D. 262,007. (See D. 260,624.)

D. 263,465, Franzus Co., Inc., VOLTAGE CONVERTER OR SIMILAR ARTICLE, **filed** Mar. 28, 1983, D.C., S.D.N.Y., Doc. 83-CIV-2368, *Franzus Co., Inc.* v. *Zurich Electric Industrial Corp.*

PP 3,130, Arthur Bright, ALMOND TREE, **filed** May 2, 1983, D.C., E.D. Calif. (Fresno), Doc. CV-F-83-180-REC, *Arthur Bright* v. *Berenda Mesa Farming, et al.*

PATENT NOTICES

Certificates of Correction for the Week of July 19, 1983

Re. 31,176	4,341,776	4,370,256	4,377,870
Des. 267,431	4,346,171	4,371,184	4,378,361
4,179,747	4,346,914	4,371,408	4,378,503
4,204,928	4,348,346	4,371,606	4,378,530
4,256,459	4,349,826	4,372,618	4,378,555
4,268,299	4,350,084	4,372,827	4,378,598
4,268,693	4,352,178	4,373,442	4,378,827
4,269,673	4,354,381	4,373,901	4,378,855
4,276,101	4,354,488	4,373,932	4,380,540
4,286,240	4,355,815	4,373,948	4,380,628
4,294,376	4,356,739	4,374,140	4,381,081
4,296,256	4,357,268	4,375,562	4,381,396
4,298,395	4,358,420	4,376,088	4,381,472
4,307,238	4,359,584	4,376,262	4,381,711
4,307,256	4,360,741	4,376,319	4,381,862
4,311,703	4,361,169	4,376,476	4,381,933
4,311,925	4,361,997	4,376,953	4,382,246
4,321,918	4,363,541	4,377,488	4,382,767
4,325,881	4,366,305	4,377,525	4,383,016
4,326,265	4,369,232	4,377,611	4,383,389
4,336,572	4,369,436	4,377,673	4,383,735
4,339,576	4,370,008	4,377,860	4,385,155

Disclaimers

4,206,910.—*William M. Biesemeyer,* Phoenix, Ariz. TABLE SAW FENCE SYSTEM. Patent dated June 10, 1980. Disclaimer filed June 6, 1983, by the inventor.

Hereby enters this disclaimer to claims 1 through 7 of said patent.

4,316,116.—*James A. Graves,* Highland Hts. and *Gilbert H. Reilings,* Chardon, Ohio. TRIPLE-COIL INCANDESCENT FILAMENT. Patent dated Feb. 16, 1982. Disclaimer filed May 27, 1983, by the assignee, *General Electric Co.*

Hereby enters this disclaimer to claims 1 through 5 of said patent.

4,360,510.—*Julian W. Proctor,* Pittsburgh, Pa. METHOD FOR SCREENING ANTI-TUMOR AGENTS OF THE RETICULO-ENDOTHELIAL STIMULANT CLASS. Patent dated Nov. 23, 1982. Disclaimer filed May 31, 1983, by the inventor.

Hereby enters this disclaimer to claim 4 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

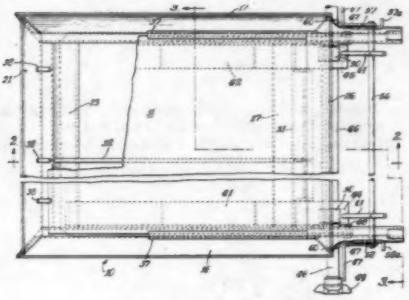
Patents ..... Numbers 3,243,822 to 3,248,737, inclusive
Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REEXAMINATIONS

JULY 19, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,707,126 (107th)
HOPPER GATE LATCHING MECHANISM
Francis M. Nester, Mechanicsburg, Pa., assignor to K.S. Industries, Inc., Lombard, Ill.
Reexamination Request No. 90/000,167, Feb. 24, 1982.
Reexamination Certificate for Patent No. 3,707,126, issued Dec. 26, 1972, Ser. No. 54,245, Jul. 13, 1970.
U.S. Cl. 105/282 P **Int. Cl.³ B61D** *7/20*; **E05** *65/14*



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **1** is confirmed.

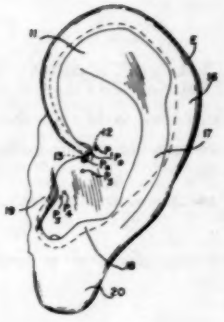
Claim **4**, having been finally determined to be unpatentable, is cancelled.

Claim **2** is determined to be patentable as amended:

Claim **3**, dependent on an amended claim, is determined to be patentable.

2. A discharge gate and lock assembly for a hopper car having a discharge opening on the underside thereof, said assembly comprising a frame adapted to be attached to said car at said opening, a plate mounted on said frame for generally horizontal movement between a closed position where it covers said opening and an open position where it uncovers said opening, a latch rod pivotally mounted on said frame and extending generally transversely of the direction of movement of said plate, a handle on each end of said latch rod adjacent a side of said frame, and an elongated latch on said rod adjacent said plate, said latch being rotatable by turning either one of said handles between an engaged position in which one end portion of said latch engages and holds said plate in said closed position and a disengaged position in which the one end portion extends upwardly from the rod and permits opening movement of said plate and the opposite end portion of said latch extends downwardly from the rod in the patch of movement of a portion of said plate and movement of said plate toward its open position resulting in said portion of said plate striking said opposite end portion and tripping said latch from said disengaged position toward said engaged position, said latch being positioned on said rod relative to said handles to be pulled by the weight of said handles and said one end portion into said engaged position after the tripping of said latch when said plate is returned to closed position, *said opposite end portion of said latch when in said disengaged position extending downwardly into said path of movement of said portion of said plate to be struck and rotated to a tripped position upon movement of said plate toward said open position, said one end portion of said latch resting on the upper surface of said plate when in said tripped position and in position for subsequent automatic movement into said engaged position when said plate moves into said closed position.*

B1 4,073,296 (108th)
APPARATUS FOR ACUPRESSURE TREATMENT
Francis J. McCall, Box 236, Lansing, Ill. 60438
Reexamination Request No. 90/000,195, May 4, 1982.
Reexamination Certificate for Patent No. 4,073,296, issued Feb. 14, 1978, Ser. No. 646,003, Jan. 2, 1976.
Int. Cl.³ A61B *17/00*; **A61H** *39/04* **U.S. Cl. 128/303 R**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–3** is confirmed.

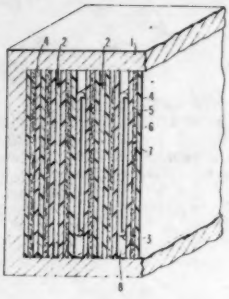
New claims **4** and **5** are added and determined to be patentable.

4. An acupressure treatment device comprising:
a plastic mold closely conforming to a human external ear, said plastic mold to be locatable in a predetermined position and only in this said predetermined position within the external ear;
said mold to be removably retained within said external ear in said predetermined position, said mold to be located directly adjacent acupucture points located within said external ear which are to influence corresponding specific body functions to be treated; and
nodule means imbedded within said plastic mold, said nodule means to contact said external ear, said nodule means not less than about one millimeter in diameter, said nodule means positioned on said mold to depress at least one of said acupuncture points and thereby treat as least one said corresponding specific body function when said mold is retained in said predetermined position in said ear.

B1 4,054,937 (109th)
CAPACITOR

Lyon Mandelcorn, Pittsburgh; Robert L. Miller, Murrysville, both of Pa.; George E. Mercier; John H. Pickett, both of Bloomington, Ind.; Thomas W. Dakin, Murrysville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Reexamination Request No. 90/000,138, Jan. 18, 1982.
Reexamination Certificate for Patent No. 4,054,937, issued Oct. 18, 1977, Ser. No. 681,292, Apr. 28, 1976.
U.S. Cl. 361/315 Int. Cl.³ H01G *4/22*; H01B *3/00*



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

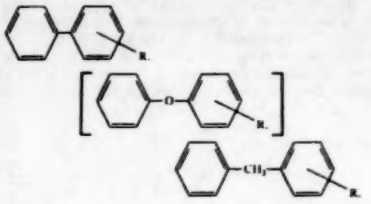
Claim 1 is determined to be patentable as amended:

Claims 2–15, dependent on an amended claim, are determined to be patentable.

New claims **16–22** are added and determined to be patentable.

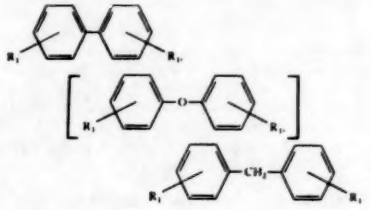
1. A capacitor comprising layers of metal foil alternating with a dielectric spacer impregnated with a dielectric fluid which comprises:

(a) about 80 to about 99% by weight of a compound having the general formula



or mixtures thereof, where each R is independently selected from alkyl from C_2 to C_4; and

(b) about 1 to about 20% by weight of a compound having the general formula



or mixtures thereof, where each R_1 is independently selected from alkyl from C_2 to C_4.

REISSUES

JULY 19, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,312

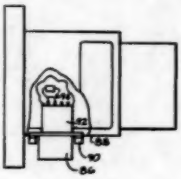
TENSION MONITOR MEANS

Gerald R. Eddens, St. Louis, Mo., assignor to W. J. Industries, Inc., Fenton, Mo.

Original No. 4,130,014, dated Dec. 19, 1978, Ser. No. 840,646, Oct. 11, 1977. Application for reissue Aug. 21, 1981, Ser. No. 295,225

Int. Cl.³ G01L *5/10*

U.S. Cl. 73—862.48 19 Claims



1. Apparatus for measuring the tension in a continuously moving web comprising in combination, two spaced frame members, a shaft extending between the frame members and having web engaging means rotatably mounted thereon, coupling members connecting opposite ends of the shaft to the respective frame members, each of the coupling members having *substantially planar members arranged to be intersected at intermediate locations by and to be substantially normal to the axis of the shaft, and two spaced opposed* two spaced deflectable portions located respectively on opposite sides of the axis of the shaft, *each of said deflectable portions including a member which is relatively deflectable in a preselected plane only and each having spaced end edges integrally connected with the respective spaced planar members whereby the deflectable portions and the planar members form an enclosed structure such that when pressure is applied to the shaft by the web in a direction to cause one of the planar members to move relative to the other the deflectable portions will deflect so as to maintain the planar members in essentially parallel relation,* means for holding the web in engagement with the rotatably mounted means for producing a web tension load component on the shaft with web tension load components deflecting the shaft and straining the deflectable portions *while maintaining the spaced substantially planar members in an essentially parallel relation,* and strain sensing transducing means located on at least one of the deflectable portions for conveying therefrom a signal derived from said straining and therefore representative of the tension in the web.

Re. 31,313

METHOD AND SYSTEM FOR WELL TESTING

John V. Fredd, and Phillip S. Sizer, both of Dallas, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Original No. 4,274,485, dated Jun. 23, 1981, Ser. No. 78,712, Sep. 25, 1979. Application for reissue Oct. 15, 1981, Ser. No. 311,638

Int. Cl.³ E21B *34/14, 43/12, 47/00;* F16K *31/44*

U.S. Cl. 166—250 17 Claims

1. A valve comprising,

a valve body having a seat therein,

a valve member cooperable with said seat and controlling flow through the valve body,

first resilient means urging said valve member to one of open and closed positions,

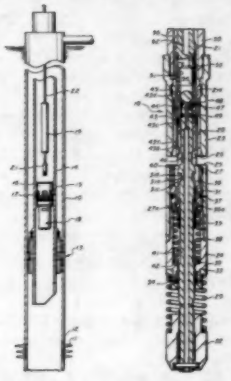
a plunger connected to said valve member and moving with the valve member between open and closed positions,

said connection between the plunger and valve member providing for movement of said plunger relative to the valve member after the valve member reaches the other of said open and closed positions,

second resilient means opposing relative movement between the plunger and valve member,

pulling means releasably latching onto said plunger, and

latch release means releasing said pulling means from said plunger upon movement of said plunger a selected distance in a direction toward said other position after said valve member has moved to said other position.



15. The method of testing a well having a tubing with a landing nipple and a by-pass valve in said landing nipple comprising,

running a transducer probe into the tubing and landing the probe in the by-pass valve,

alternately flowing the well and shutting in the well by raising and lowering said probe after it is landed in the valve,

determining well conditions while said well is shut-in and flowing.

Re. 31,314

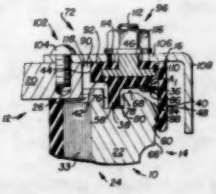
BRAKE DRUM SEAL WITH DUAL ELASTOMERIC LEGS

James G. Biaha, Painesville, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Original No. 4,243,234, dated Jan. 6, 1981, Ser. No. 12,162, Jan. 18, 1979. Application for reissue Feb. 23, 1981, Ser. No. 236,953

Int. Cl.³ F16J *15/32, 15/34*

U.S. Cl. 277—84 22 Claims



1. A seal assembly (10), comprising:

a first member (12);

a second member (14) having an outer surface (66), a face (68) and a central axis (70), said outer surface (66) being

oriented generally along said central axis (70), said face (68) having an annular opening (76) and extending inwardly from said outer surface (66) in a direction toward said central axis (70), said annular opening (76) having sidewalls (78) and a bottom surface (80), said first and second members (12,14) being rotatable one relative to the other;

first means (28) for supporting said first and second members (12,14) in rotation one relative to the other;

a body (36) having first and second end portions (50,52) and a first side (42) and being positioned adjacent and about said annular opening (26);

a first leg (38) having a sealing surface (58) and being connected to the [second end portion (52)] *first end portion (50)* of the body (36) and extending outwardly from the first side (42) of the body (36) into said annular opening (76), said sealing surface [56] *58* being in sealing, slidable contact with the face (68) of the second member (14) in said annular opening (76);

a second leg (40) having a sealing surface (60) and being connected to the second end portion (52) of the body (36) and extending outwardly from the first side (42) of the body (36), said sealing surface (60) being in sealing, slidable contact with the second member (14) radially relative to said central axis (70) at the outer surface (66) of said second member (14); and

second means (72) for sealably connecting said body (36) to said first member (12).

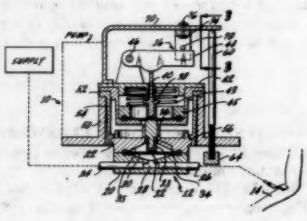
Re. 31,315
APPARATUS FOR CONVERTING A PUMP TO A CONTROLLER

Jon A. Jenkins, Rancho Sante Fe, and Raymond E. Cannon, San Diego, both of Calif., assignors to Imed Corporation, San Diego, Calif.

Original No. 4,277,227, dated Jul. 7, 1981, Ser. No. 53,981, Jul. 2, 1979. Application for reissue Nov. 13, 1981, Ser. No. 321,192

Int. Cl.³ B04B *21/00*; A61M *5/20*

U.S. Cl. 417—63 **40 Claims**



1. In combination for use with a pump for introducing fluid to a receiver and for controlling the pressure of the fluid introduced by the pump to the receiver, the pump having detent means,

an output line for passing the fluid from the pump to the receiver,

a resilient diaphragm connected in the output line for constraint in accordance with the pressure of the fluid in the line,

means movable with the diaphragm for obtaining the production of an output indication when the pressure of the fluid in the output line has reached a particular level,

a housing holding the output line, the diaphragm and the movable means, and

detent means on the housing for co-operating with the detent means on the pump for releasably holding the housing in a particular fixed relationship with the pump.

Re. 31,316
ELONGATED IGNITING DEVICE

Robert W. Moore, 449 E. Altgeld Ave., Glendale Heights, Ill. 60137

Original No. 4,315,731, dated Feb. 16, 1982, Ser. No. 242,362, Mar. 10, 1981. Application for reissue Apr. 12, 1982, Ser. No. 367,381

Int. Cl.³ F23Q *1/04*

U.S. Cl. 431—254 **15 Claims**

13. An elongated igniting device for a conventional cigarette lighter having a head end with a rotatable fling wheel adjacent a movable valve actuator controlling flow of fuel through a valve to an outlet port, said device comprising:

an elongated shank;

a handgrip on one end portion of said shank;

holding means on the opposite end portion of said shank for releasably retaining the cigarette lighter with the head end facing away from the hand grip;

an actuator rod guided for reciprocable movement parallel to said shank, said rod having an outer extension beyond the head end of the lighter and being movable between extended and retracted mode conditions relative to the lighter head end;

trigger means adjacent the hand grip and connected to the actuator rod, effective in response to pull on the trigger, to move said actuator rod to said retracted mode condition; and

igniting means supported on said outer extension in position to engage and rotate the rim of said flint wheel and depress said valve actuator to ignite the lighter in response to movement of the actuator rod to its said retracted mode condition.

Re. 31,317
RARE EARTH-COBALT SYSTEM PERMANENT MAGNETIC ALLOYS AND METHOD OF PREPARING SAME

Nobuo Imaizumi, and Kazuo Wakana, both of Tokyo, Japan, assignors to Namiki Precision Jewel Co., Ltd., Tokyo, Japan

Original No. 4,221,613, dated Sep. 9, 1980, Ser. No. 6,,024, Jan. 24, 1979. Application for reissue Nov. 24, 1980, Ser. No. 209,664

Claims priority, application Japan, Feb. 3, 1978, 53-015518

Int. Cl.³ H01F *1/02*

U.S. Cl. 148—103 **7 Claims**

1. Permanent magnetic alloys comprising 11.5–12.5% rare earth components of which 6.3–12% is samarium and 0.5–6.2% in yttrium; 0.2–2.5% hafnium, [19.5–26.5%] *10.5–26.5%* iron, 7–10.5% copper, and 52-[70.7%] *70.8%* cobalt, the ranges of the aforesaid components being in atomic ratios.

2. A method of preparing the alloys of claim 1 comprising the steps of melting raw material containing said components, solidifying the resulting melt, pulverizing the resulting ingot into powders having a grain size of 1–50 μm, compacting the powders after magnetic field orientation thereof, sintering said compacted powders at 1160°–1220° C. for 1–10 hours, cooling the sintered body at a rate of at least 1° C./second at least until the temperature is about 900° C., and then annealing the resulting bulk at 750°–900° C.

Re. 31,318

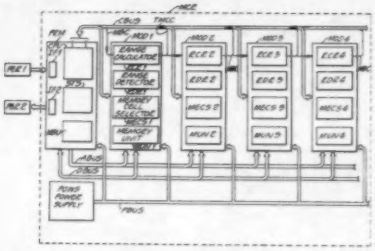
AUTOMATIC MODULAR MEMORY ADDRESS ALLOCATION SYSTEM

Phillip A. Kaufman, Saratoga, Calif.; Kenneth C. Gorman, Boulder, Colo.; George C. Henry, Mission Viejo, and Roy Blacksher, Cupertino, both of Calif., assignors to Computer Automation, Inc., Irvine, Calif.

Original No. 4,025,903, dated May 24, 1977, Ser. No. 395,548, Sep. 10, 1973. Application for reissue May 23, 1979, Ser. No. 41,746

Int. Cl.³ G06F *13/06*; G11C *5/06, 7/00, 9/00*

U.S. Cl. 364—200 **51 Claims**



7. In a digital computer having a processing unit and a system for selectively addressing individual memory cells for a memory bank having a plurality of separate memory units, each said memory unit *being replaceable by memory units* containing a *different* number of memory cells, for storing information in or for reading information from such cells in accordance with a corresponding selectable absolute address signal generated by said processing unit to represent an absolute address, the combination of:

a plurality of memory capacity signal sources [associated with] *located on* said memory units on a one-to-one basis, each signal source supplying a signal representing the memory cell capacity of the memory unit with respect to which said last mentioned signal source is associated;

an auxiliary signal source for establishing an initial digital starting address;

range setting means controlled by said plurality of said signal sources for establishing a unique fixed digital starting address for each individual memory unit

and for establishing a unique fixed ending address for each individual memory unit in accordance with said unique starting address and the memory capacity of said each individual memory unit, and for generating signals representing said starting and ending addresses respectively;

and a plurality of range detectors associated with said memory units on a one-to-one basis, each such range detector being controlled in accordance with a selected absolute address signal and in accordance with the starting and ending address signals of the associated memory unit, for enabling said individual memory unit to select a memory cell therein corresponding to said selected absolute address only when said selected absolute address lies within the local range of the associated memory unit.

Re. 31,319

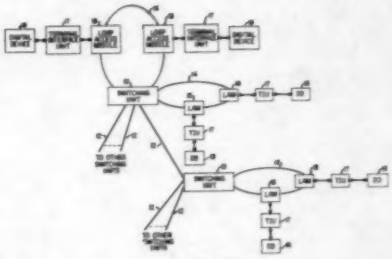
DIGITAL DATA COMMUNICATION SYSTEM

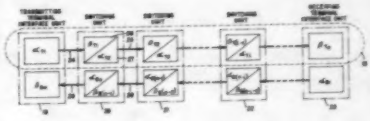
Alexander G. Fraser, Bernardsville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,749,845, dated Jul. 31, 1973, Ser. No. 175,678, Aug. 27, 1971. Application for reissue Feb. 25, 1980, Ser. No. 123,970

Int. Cl.³ H04J *3/16*

U.S. Cl. 370—80 **19 Claims**





1. A data transmission system for *supporting data cells among* a plurality of digital devices, *a data call being comprised of randomly occurring bursts of data with intervening pauses,* comprising means for virtually allocating transmission paths upon request *preparatory to establishing data calls* from any of said digital devices to any other of said digital [device] *devices by assigning to each call a description of transmission resources to convey the data* and means for activating said virtually allocated transmission for [paths] *path in accordance with the assigned description* only [when] *upon determination that a* data *burst of the call* is actually transmitted.

PLANT PATENTS

GRANTED JULY 19, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,069

MINIATURE ROSE PLANT

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Jan. 25, 1982, Ser. No. 342,711
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, much branched habit, substantially as illustrated and described, characterized by buds and flowers similar in coloring to the variety Tiffany a hybrid tea.

5,070

MINIATURE ROSE PLANT

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Feb. 1, 1982, Ser. No. 344,538
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, much branched habit, substantially as illustrated and described, characterized by buds and flowers similar in coloring to the variety Perfume Delight a hybrid tea; and further characterized by a low growing; compact plant of miniature proportions.

5,071

STRAWBERRY PLANT

Harold A. Johnson, Jr., Watsonville, Calif., assignor to Driscoll Strawberry Associates, Inc., Watsonville, Calif.

Filed Jan. 11, 1982, Ser. No. 338,774
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—48 1 Claim

1. The new and distinct strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

5,072

CALLISTEMON 'BOYETTE'

John A. Blaser, 7605 N. Tuttle Ave., and Robert J. Boyette, 2340 Tallevast Rd., both of Sarasota, Fla. 33581

Filed Nov. 24, 1981, Ser. No. 324,676
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—54 1 Claim

1. The new and distinct variety of *Callistemon viminalis* substantially as herein shown and described, characterized particularly as to novelty by an extreme weeping habit and persistent year-round blooming.

PATENTS

GRANTED JUL. 19, 1983

ERRATA

For CLASS	See PATENT NO.
604–115	4,393,870
604–055	4,393,871
604–151	4,393,872
604–151	4,393,873
135–109	4,393,887
192–099	4,393,907
104–069	4,394,173
585–667	4,394,255
264–004	4,394,287
524–776	4,394,307
377–105	4,394,587
315–280	4,394,605

PATENTS

GRANTED JULY 19, 1983

GENERAL AND MECHANICAL

4,393,519
COMBINATION VISOR AND SWEATBAND
Norman J. Nicastro, 6210 E. Jenan, Scottsdale, Ariz. 85254
Filed Mar. 16, 1981, Ser. No. 243,793
Int. Cl.³ A61F *9/04*
U.S. Cl. 2—12 **8 Claims**

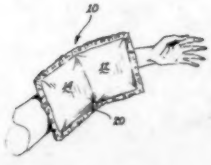
1. Headgear adapted for use with an eyeshield of the type including eye protecting lenses supported on a lens frame worn by a user, said headgear comprising:

(a) a head band adapted to encircle the head of the user and positionable in retained relationship thereon on a person's head, at least a portion of said head band being constructed of a material which is elasticized and stretchable and moisture absorbent said portion forming a section adapted to bear on and closely conform to the forehead of the user;

(b) a flexible visor attached to said head band at said section and extending along its entire length from the head band forwardly therefrom, said visor having an outer edge;

(c) fastener means on said visor adapted to engage the said lens frame whereby said visor is extendable and securable between the head band and said frame to form a protective shield fully extending in the peri-ocular area between the forehead of the user and the frame, with said eye protecting lenses held in a position whereby moisture accumulation on the lenses is minimized and the entire peri-ocular area is substantially shielded from solar rays.

4,393,520
ELBOW PILLOW
Coral A. Koch, 2067 W. Rainbow Ridge, Tucson, Ariz. 85745
Filed Feb. 1, 1982, Ser. No. 345,026
Int. Cl.³ A41D *13/08*
U.S. Cl. 2—16 **5 Claims**



1. Apparatus for distributing loads in the crook of a user's arm to avoid impeding blood circulation on placement of a load at the crook of the arm and without restricting elbow movement, said apparatus comprising in combination:

(a) a first sheet of flexible material;

(b) a second sheet of flexible material;

(c) stuffing disposed intermediate said first and second sheets of material, said stuffing being divided into two segregated divisions;

(d) means extending about the perimeter of said first and second sheets of material for enclosing the two divisions of said stuffing therebetween;

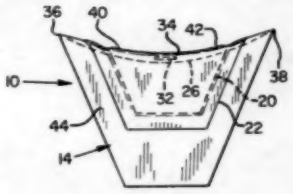
(e) means for securing said first and second sheets of material against one another intermediate the divisions of said stuffing and transverse to said apparatus to form two parts of said apparatus flexibly juxtaposed with one another by said two sheets of material;

(f) first strap means attached to one of the parts of said apparatus for encircling the user's forearm; and

(g) second strap means attached to another of the parts of said apparatus for encircling the user's upper arm, said first and second strap means operating in concert to maintain continuingly during use of said apparatus and securing means positionally coincident with the crook of the arm to permit flexing of said apparatus commensurate with bending of the arm;

whereby, said apparatus is retainable adjacent the crook of a user's arm by said first and second straps to cushion the crook of the arm and distribute any loads placed thereon and without impeding blood circulation or restricting elbow movement.

4,393,521
DISPOSABLE GARMENT SHIELD AND METHOD OF MANUFACTURE
Carolyn R. Jones, 2818 S. Poplar Way, Lake Oswego, Oreg. 97304
Filed Apr. 6, 1981, Ser. No. 250,918
Int. Cl.³ A41D *27/12*; D05B *97/00*
U.S. Cl. 2—56 **28 Claims**



1. A disposable garment shield for positioning under the arm of the user in the sleeve area of a garment being worn,

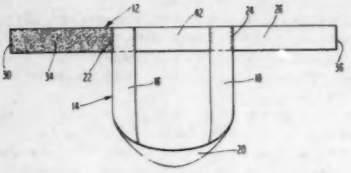
said shield having a first side adapted to be secured to the garment being worn and a second moisture absorbent side, said shield having a transverse fold line thereacross,

said shield being folded toward said second side from said fold line up to a location longitudinally removed from said fold line, and reversely folded beyond said location exposing said second side and causing said shield to be depressed between lateral ends of said fold line forming a concavity adapting said shield to fit the underarm of the user.

4,393,522
ANKLE GARTER WITH FOOT STIRRUP
Diane M. Calabrese, 9710 Roosevelt Blvd., Philadelphia, Pa. 19115
Filed Dec. 4, 1981, Ser. No. 327,275
Int. Cl.³ A41F *1/00*; A41D *1/06*
U.S. Cl. 2—336 **4 Claims**

1. An article to hold a pants leg in place on the foot for ease of insertion into a sock, boot or the like comprising an open ended garter band adapted to adjustably wrap around the

bottom of the pants adjacent the ankle of the foot, a U-shaped longitudinally elastic stirrup having legs affixed to said garter band inwardly of the free ends of said garter band, the length of said garter band between the points on connection of said stirrup legs to said garter band being longitudinally elastic, and means at the opposite faces of said garter band adjacent its free



ends mating by finger pressure to releasably close said garter band, said means including a fuzz portion on the inner face of said garter band adjacent one free end thereof and a mating hook portion on the outer face of said garter band adjacent its other end whereby when said ends are overlapped and pressed together said fuzz and hook portions will releasably interengage.

4,393,523

TUB FILLING AND SHOWER VALVE

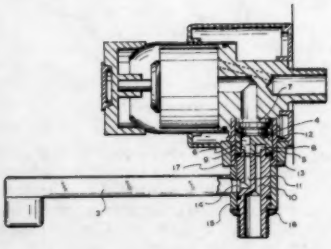
Werner Nolden, Wittlich, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.

Filed Mar. 30, 1982, Ser. No. 363,695

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1981, 3113615

Int. Cl.³ E03C *1/04*

U.S. Cl. 4—192 **2 Claims**



1. Tub filling and shower valve comprising a pivotable tub inlet assembly including a change-over valve means for directing the flow of water from a tub mode to a shower mode, said change-over valve means having a pair of superimposed control discs, one of which is a seating disc having a throughput opening coupled to a water discharge mixing chamber and the other control disc being rotatably mounted on said seating disc and having two throughput openings which are adapted to be aligned with said throughput opening of said seating disc, a control bushing rotatably mounted in a housing of said valve and having a pair of conduits, one end of which is coupled to said throughput openings of said rotatable disc with the opposite end being coupled to a shower outlet by one of said conduits of said control bushing and said other conduit being coupled to said pivotable tub inlet means of a lateral discharge opening in said control bushing.

4,393,524

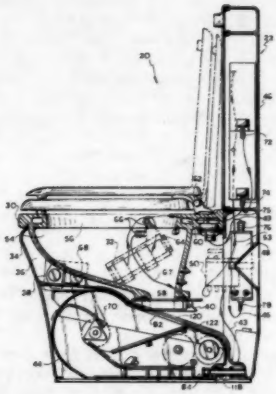
SELF-CONTAINED SEWAGE WASTE DISPOSAL SYSTEM

Clifton F. Briner, Lafayette, Ind.; William R. Bocchini, Wyckoff, and Brian Wilcockson, Long Beach Island, both of N.J., assignors to American Standard, Inc., New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,595

Int. Cl.³ E03D *5/016*

U.S. Cl. 4—317 **19 Claims**



1. A self-contained sewage waste disposal system comprising; a housing structure, a toilet bowl adapted to receive human waste and fluid for diluting the waste, transporting the waste and rinsing the bowl, a removable filter cassette in the housing in communication with the toilet bowl, means for flushing the bowl and dumping the contents into the filter cassette and for subsequent refilling of the bowl, filter means in the cassette for separating the coarse and fine particles of solid material from the fluid received from the bowl, storage means in the cassette to store the solid material in a compact manner for subsequent disposal upon removal of the cassette, pump means including interconnected conduits in the housing to transport fluid from the interior of the system to fill the bowl after a flush, to transport filtered fluid from the filter cassette to a position for recirculation, and control means to pass the fluid through the system to facilitate the collection and disposal of sewage waste within the system in a predetermined sequence.

4,393,525

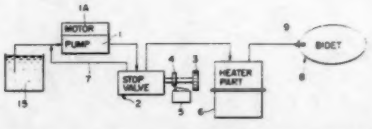
HEAT-CONTROLLED SANITARY BATHING DEVICE

Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Nitsu Keiki Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1981, Ser. No. 330,950

Int. Cl.³ A47K *3/20*

U.S. Cl. 4—420.2 **5 Claims**



1. In a water-closet apparatus with a heat-controlled bathing system, including a heater for heating feed water to a predetermined temperature, a bidet portion having nozzle means adapted for spraying heated water supplied from said heater, a pump for feeding water to said heater and nozzle means, and a valve means for controlling the flow rate of water to said heater, the improvement which comprises:

said control valve means comprising a tubular valve casing defining axially contiguously aligned discharge, supply and recirculating chambers therein; an inlet port provided in said valve casing at a location so that feed water from said pump may be supplied to said supply chamber therethrough; a discharge port provided in said valve casing at a location so that feed water in said discharge chamber may be fed to said heater therethrough; a recirculating port provided in said valve casing at a location so that the feed water in said recirculating chamber may be recirculated to the suction side of said pump; main and auxiliary valve seats provided in said valve casing at positions between said discharge and supply chambers and between said supply and recirculating chambers, respectively; a valve plug axially movably accommodated in said supply chamber and having main and auxiliary valve faces cooperable with said main and auxiliary valve seats, respectively, for controlling the rate of water flowing therethrough, said valve plug being constantly urged to engage said main valve face with said main valve seat; and a valve stem threaded into said valve casing for axial movements and having a portion adapted for abutting engagement with said valve plug for displacing said valve plug so that, by turning said valve stem, feed water supplied to said supply chamber from said pump may be admitted into either one or both of said discharge and recirculating chambers; and

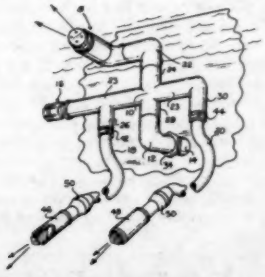
said heater comprising an outer vessel; an inner vessel defining a primary chamber therein and placed inside of said outer vessel to define a secondary chamber therebetween; a water feed pipe extending between said primary chamber and said outlet port of said water control valve; an opening provided in an upper portion of said primary chamber so that said primary chamber is in fluid communication with said secondary chamber; first and second heating means for heating water in said primary and secondary chambers to predetermined temperature levels, respectively; a heated water feed means extending between said secondary chamber and said nozzle means; and means for stopping operation of said pump when the water temperature in said secondary chamber exceeds said predetermined temperature level.

4,393,526

POOL CLEANING APPARATUS

Paul B. Miller, 6513 Temba Dr., and Tony C. R. Miller, 6484 DuSault Dr., both of San Jose, Calif. 95119

Filed Nov. 23, 1981, Ser. No. 323,928
Int. Cl.³ B08B 9/08; E04H 3/16
U.S. Cl. 4—490 **11 Claims**



1. A pool cleaning apparatus for attachment to a pressurized inlet of a swimming pool, the apparatus comprising:

(a) a main body portion provided with a chamber;

(b) first means coupling said main body portion to said inlet such that pressurized water may flow from said inlet into said chamber;

(c) a pressure relief valve coupled to said main body portion for selectively venting said pressurized water within said chamber;

(d) an elongated, flexible primary cleaning hose having a first end coupled to said main body portion and opening on said chamber, whereby pressurized water from said chamber may flow out a second end of said hose;

(e) a nozzle submerged below the surface of the water contained by said swimming pool to direct a flow of water towards said water surface; and

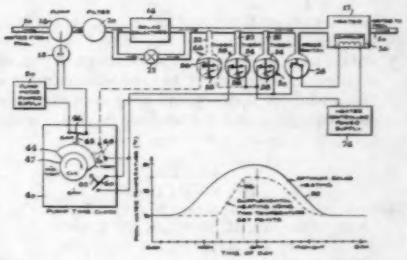
(f) second means coupling said nozzle to said main body such that pressurized water from said chamber may flow out of said nozzle, wherein said second means is adjustable to permit the angle and direction of the flow of water from said nozzle to be varied.

4,393,527

METHOD OF CONTROLLING NON-SOLAR SWIMMING POOL HEATER

Robert M. Ramey, North Hollywood, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 220,377, Dec. 29, 1980, Pat. No. 4,368,549. This application Sep. 15, 1982, Ser. No. 418,556
Int. Cl.³ E04H 3/16, 3/18
U.S. Cl. 4—493 **1 Claim**



1. A method of controlling a non-solar heater to provide supplemental heating for a solar-collector heated swimming pool, comprising the steps of:

providing solar collectors;

connecting the solar collectors to heat the water in the swimming pool, whereby the collectors establish an optimum daily water temperature vs. time profile when full solar energy is available;

connecting the non-solar heater to heat the water in the swimming pool;

providing a non-solar heater temperature vs. time profile which closely approximates the optimum profile; and

controlling the non-solar heater to heat the pool water in accordance with the non-solar heater temperature vs. time profile, whereby the non-solar heater acts to supplement the solar collectors to that the water temperature closely approximates the optimum temperature profile when full solar energy is not available.

4,393,528

ADJUSTABLE TRAMPOLINE TYPE POOL AND HOT TUB COVER

Trent W. West, P.O. Box 956, Aptos, Calif. 95003

Filed May 1, 1981, Ser. No. 259,414
Int. Cl.³ E04H 3/16
U.S. Cl. 4—498 **17 Claims**

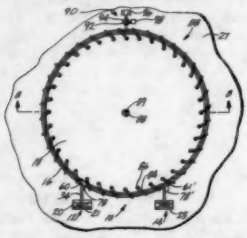
1. A cover for covering pools comprising:

at least one hinge for mounting to a rigid support adjacent the pool;

a hinge arm pivotally mounted in such a hinge for pivoting

between open and cover pool positions, the arm having an axis and first and second ends, the arm being pivotable at the first end thereof about a pivot axis defined in the hinge, the arm being capable of movement through a predetermined angle of rotation away from a plane that is substantially normal to the pivot axis;

a clamp at the second end of the arm, the clamp having an axis oriented at a predetermined clamp angle relative to the axis of the arm;



a hoop having a perimetral shape conforming to and circumscribing the pool, said hoop secured in the clamp, an interior hoop area being defined by the perimeter of the hoop; and

a panel for covering the pool and secured to the hoop and spanning the interior hoop area thereof, the clamp angle and the angle of rotation of said hinge arm in combination allowing for adjustment of the hoop in the clamp in accordance with the shape of said hoop such that when the panel covers the pool the hoop lies in a horizontal plane.

4,393,529

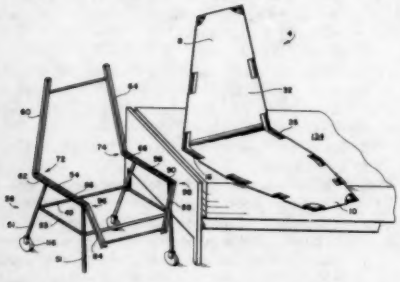
INVALID CHAIR

Elizabeth Britz, 2303 First Street, New Port Richey, Fla. 33552

Filed Sep. 24, 1980, Ser. No. 190,468

Int. Cl.³ A61G *1/02, 1/04, 7/02*

U.S. Cl. 5—81 R **5 Claims**



1. A two-part invalid chair, comprising:

an elongated, tubular frame having an open inner area bounded by a U-shaped, tubular, head-supporting portion on a first end and a U-shaped, tubular, foot-supporting portion on a second end with a first leg of said head portion connected to a first end of a first tubular, flank-supporting portion whose second end is connected to a first leg of said foot-supporting portion and with a second leg of said head portion connected to a first end of a second, tubular, flank-supporting portion whose second end is connected to a second leg of said foot-supporting portion;

a body supporting web suspended in said open inner area of said frame and mounted to said U-shaped head-supporting portion, said flank-supporting portions and said U-shaped foot-supporting portion;

a first horizontal trough mounted to a support base, having a semi-circular cross section which conforms to the shape of said first tubular, flank-supporting portion of said frame and a second horizontal trough mounted to said support base, having a semi-circular cross section which conforms to the shape of said second tubular, flank-supporting portion of said frame, for removably mounting said flank-supporting portions to said support base;

said first and second flank-supporting portions of said frame being in a substantially, mutually parallel relationship at a predetermined separation distance;

said first and second horizontal troughs being mounted to said support base in a substantially, mutually parallel relationship at said predetermined separation distance for removably mounting said respective flank-supporting portions thereto;

a first clamp mounted to said first horizontal trough of said base, for clamping said first flank-supporting portion of said frame thereto;

a second clamp mounted to said second horizontal trough of said base, for clamping said second flank-supporting portion of said frame thereto;

a first upper trough mounted to a first end of said first horizontal trough, having a semi-circular cross section which conforms to the shape of said first leg of said U-shaped, tubular, head-supporting portion of said frame and a second upper trough mounted to a first end of said second horizontal trough, having a semi-circular cross section which conforms to the shape of said second leg of said U-shaped, tubular, head-supporting portion of said frame, for removably mounting said head-supporting portion thereto;

said first and second upper troughs being mounted to said respective first and second horizontal troughs in a mutually spaced relationship for removably mounting the tubular contours of said respective first and second legs of said head-supporting portion of said frame into said semi-circular contours of said respective upper troughs;

a first clamp mounted to said first upper trough of said base, for clamping said first leg of said head-supporting portion of said frame thereto;

a second clamp mounted to said second upper trough of said base, for clamping said second leg of said head-supporting portion of said frame thereto;

said first leg of said U-shaped head-supporting portion of said frame being hingedly mounted to said first end of said first flank-supporting portion and said second leg of said U-shaped head-supporting portion of said frame being hingedly mounted to said first end of said second flank-supporting portion;

said first upper trough of said base being hingedly mounted to said first end of said first horizontal trough and said second upper trough of said base being hingedly mounted to said first end of said second horizontal trough;

a first lower trough mounted to a second end of said first horizontal trough, having a semi-circular cross section which conforms to the shape of said first leg of said U-shaped, tubular, foot-supporting portion of said frame and a second lower trough mounted to a second end of said second horizontal trough, having a semi-circular cross section which conforms to the shape of said second leg of said U-shaped, tubular, foot-supporting portion of said frame, for removably mounting said foot-supporting portion thereto;

said first and second lower troughs being mounted to said respective first and second horizontal troughs in a mutually spaced relationship for removably mounting the tubular contours of said respective first and second legs of said foot-supporting portion of said frame into said semi-circular contours of said respective lower troughs;

a first clamp mounted to said first lower trough of said base,

for clamping said first leg of said foot-supporting portion of said frame thereto; and

a second clamp mounted to said second lower trough of said base, for clamping said second leg of said foot-supporting portion of said frame thereto.

4,393,530

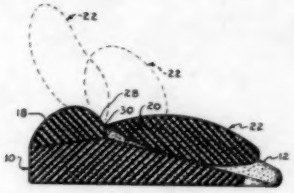
PILLOW

Lucille Stark, Pine Village II, Box 127, Hobart, Ind. 46342

Filed Nov. 17, 1981, Ser. No. 322,300

Int. Cl.³ A47G 9/00

U.S. Cl. 5—437 1 Claim



1. A pillow comprising:

a pillow body having elevated opposed end parts, an elevated side part extending laterally between said end parts, said end parts and side part defining a generally "U" shaped frame and a depressed center part extending between said end parts and said side part;

a second pillow body fitted in said depressed center part of said pillow body providing a top surface substantially even in elevation with said side part and said end parts; and

said second pillow body being connected to the side of said side part proximate to said depressed part for pivotal movement of said second pillow body out of said depressed center part against said elevated side part for support thereby in a position elevated above said end parts and side part.

4,393,531

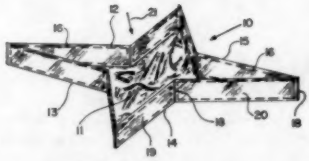
LINER FOR A WATER BED

Eugenio D. Hodel, 71 Upper Toyon, Kentfield, Calif. 94904

Filed Nov. 24, 1980, Ser. No. 209,388

Int. Cl.³ B65D 5/36; A47C 27/08

U.S. Cl. 5—451 5 Claims



1. In a waterbed which comprises a liquid containing mattress disposed in a frame, the improvement comprising a liner for a waterbed, the liner being adapted to be installed in the frame prior to installing the mattress therein, the liner comprising:

a planar bottom panel of a flexible water tight material;

a plurality of upstanding side walls secured to the periphery of said bottom panel thereby forming a container for containing therein a mattress, said side walls being adapted to encircle said mattress; and

each of said upstanding side walls having two equal sections, defined by rigid panels completely enclosed by a waterproof sheet, the two equal sections of each of said side walls being separated by a seam that permits folding of the structure, said water-tight material of all of said side walls being secured to said bottom panel in a fluid tight manner.

4,393,532

METHOD FOR CONTINUOUS DELUSTERING HIGH TEMPERATURE TREATMENT OF A TEXTILE PRODUCT AND AN APPARATUS THEREFOR

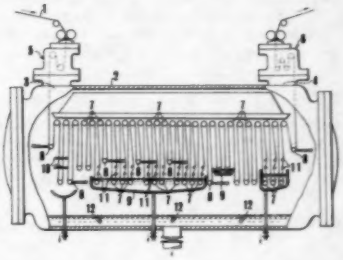
Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Apr. 15, 1981, Ser. No. 254,427

Claims priority, application Japan, Apr. 15, 1980, 55-49292; Apr. 15, 1980, 55-50632[U]

Int. Cl.³ D06B 3/12

U.S. Cl. 8—149.1 9 Claims



1. A method for continuous delustering high temperature treatment of a textile product comprising subjecting a textile product such as yarns, a strip and a cloth to be treated to steaming while transporting the textile product continuously through a steamer body maintained with a high temperature wet heat under an elevated pressure, guiding the textile product over a plurality of cloth guide rolls provided in the steamer body, and maintaining a water film between each of the guide rolls and the textile product guided therewith for preventing that the surface of the textile product is lustered.

2. An apparatus for the continuous delustering high temperature treatment of a textile product comprising a high pressure steamer, a plurality of axially extending cloth guide rolls located within said steamer and arranged to transport the textile product continuously through the steamer body, said cloth guide rolls arranged to move the textile product in an up and down zigzag path through said steamer with the textile product passing around and in contact with said cloth guide rolls, means for maintaining a high temperature wet heat within said steamer, means for supplying heated water to at least certain of said cloth guide rolls, and said cloth guide rolls each including means for maintaining a water film between each said cloth guide roll and the textile product guided thereover.

4,393,533

DEVICE FOR LAP-JOINT ENGAGEMENT OF TWO BRIDGE ELEMENTS ON INTRADOS OR EXTRADOS AND BRIDGE ELEMENT COMPRISING IT

Michel E. Terrien, and Claude Bouvet, both of Angers, France, assignors to Etat Francais, Paris, France

Filed Aug. 3, 1981, Ser. No. 289,782

Claims priority, application France, Aug. 21, 1980, 80 18257

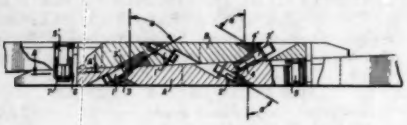
Int. Cl.³ E01D 15/14

U.S. Cl. 14—2.6 12 Claims

1. A device for permitting the lap joint connection of two bridge elements, a lower bridge element and an upper bridge element, on intrados or extrados, the lower bridge element being capable of becoming the upper bridge element and vice versa, comprising:

a means for centering the two bridge elements with respect to each other when they assume an overlapping configuration; and

a means for connecting the two bridge elements, the connecting means comprising at least two retractable studs belonging to the first bridge element and located on axes



oblique with respect to the surface of the first bridge element, the tow studs being adapted to cooperate with at least two recesses in a second bridge element, the recesses having the same inclination with respect to the surface of the second bridge element as the studs have with respect to the surface of the first bridge element.

4,393,534

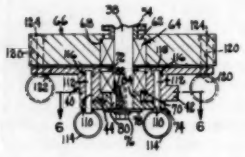
FLOOR CLEANING AND POLISHING MACHINE

Jeffrey A. Lee, Crystal, and Mike J. Todd, Eagan, both of Minn., assignors to H. B. Fuller Company, Saint Paul, Minn.

Filed Oct. 9, 1981, Ser. No. 310,000

Int. Cl.³ A47L *11/162*

U.S. Cl. 15—53 **15 Claims**



1. Apparatus for mechanically varying the speed of a disk driven rotationally about an axis by a power source, comprising:

(a) means for supporting the disk relative to the axis, said supporting means being rotatably disposed about the axis;

(b) means for imparting rotational motion to said supporting means directly from the power source and at a fixed speed;

(c) a variant speed element mounted for rotation about the axis and geared from the power source to a different speed;

(d) means for selectively keying said supporting means to one of said direct rotational motion imparting means and said variant speed element.

4,393,535

ADJUSTABLE BRUSH

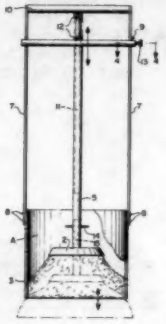
Paul Kunz, Bern, Id. 83220

Filed Mar. 17, 1981, Ser. No. 244,748

Int. Cl.³ A46B *9/10*

U.S. Cl. 15—169 **15 Claims**

15. A circular brush having an adjustable effective working diameter comprising brush means having radially projecting flexible bristles and annular sleeve means having a diameter less than the diameter of said radially projecting bristles, said sleeve means being selectively, axially movable between a first position in which said sleeve means is retracted away from the bristles of said brush means whereby said bristles project freely in the radial direction to establish a maximum effective working diameter for said brush means, and a second position in which said sleeve means is extended to at least partially surround said brush means whereby said bristles are at least partially compressed to establish an effective working diameter for said brush means which is less than said maximum effective working diameter, and guide means for maintaining the alignment of said brush means and said sleeve means, said guide means comprising a central guide rod on said sleeve means, a guide tube aligned with said guide rod mounted on said brush



means, said guide rod being telescopically received in said aligned guide tube such that said guide rod extends out of only one end of said guide tube whereby the effective length of said guide means can be varied by moving said guide rod into and out of said guide tube, and a handle connected to the top of said guide rod.

4,393,536

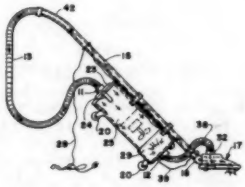
DUAL MODE VACUUM CLEANER

Ruel W. Tapp, P.O. Box 449, Tomball, Tex. 77375

Filed Jan. 25, 1982, Ser. No. 342,515

Int. Cl.³ A47L *5/14*

U.S. Cl. 15—327 C **4 Claims**



1. A vacuum cleaner apparatus comprising

(a) an elongated canister which confines an electric motor, air-moving means driven by said motor, and filtration means adapted to remove particulate material from air moved through said canister by said air-moving means,

(b) front and rear closure means associated with each end of said canister,

(c) a vacuum port positioned within said front closure means,

(d) an exhaust port positioned within said rear closure means,

(e) said vacuum and exhaust ports communicating with the interior of said canister and adapted to permit facile connection thereto of conduits,

(f) means associated with the underside of said canister to facilitate movement over a horizontal surface,

(g) means associated with the upper side of said canister for releasable attachment to a tubular member,

(h) a rigid tubular member having first and second extremities,

(i) a first flexible conduit adapted to communicate between

said vacuum port and the first extremity of said tubular member,

(j) a floor-cleaning device comprised of a housing which encloses a second electric motor and rotary brushes driven by said motor, means associated with the lowermost surface of said housing to facilitate movement over a horizontal surface, an inlet port positioned in the uppermost surface of said housing and communicating with a conduit which extends to an opening adjacent the lowermost surface of said housing, and an exit port positioned in a side surface of said housing, said exit port serving to engage the second extremity of said tubular member,

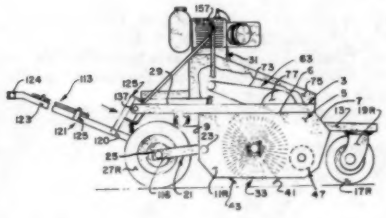
(k) and a second flexible conduit, shorter than said first flexible conduit, adapted to attach at one end to said exhaust port and at its opposite end to said inlet port when said canister is attached to said rigid tubular member in a manner such that said front closure means is upwardly directed.

4,393,537

POWER BROOM WITH AUGER AND VACUUM DEBRIS CONVEYOR

Layton J. Reprogle, and Truman B. Reprogle, both of St. Louis County, Mo., assignors to All Temp Engineering Inc., St. Louis, Mo.

Filed Jul. 13, 1981, Ser. No. 282,812
Int. Cl.³ E01H *1/04*
U.S. Cl. 15—348 **8 Claims**



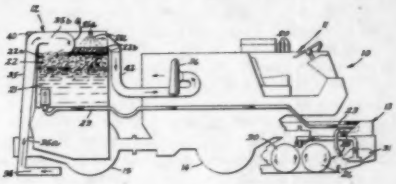
1. A power broom for removal of debris from a surface comprising a housing, a rotary brush mounted within said housing for rotation about a horizontal axis, said housing substantially enclosing said brush with the lower portion of said brush being exposed for brushing engagement with said surface, said brush being driven in such direction as to propel debris from said surface upwardly within said housing, the latter including a portion thereof adjacent said brush for receiving and collecting said debris picked up and propelled by said brush within said housing, an outlet for said debris within said housing, an auger positioned within said housing and extending generally transversely thereof for positively conveying said debris to said outlet, vacuum means in communication with said outlet for vacuum conveying said debris from said outlet, a plurality of wheels for rollingly supporting said power broom, means for driving said brush, said auger, and certain of said wheels, a handle connected to the rear of said housing and extending rearwardly therefrom, means operable in response to movement of said handle relative to said housing between first and second positions to cause said housing to be moved relative to said rear wheels and relative to said surface between an inoperative mode in which the rear wheels are not driven and in which said brush is lifted clear of said surface, an operative mode in which the rear wheels are driven in forward direction and in which said brush operatively engages said surface.

4,393,538

SCRUBBER WITH FOAM AND SPRAY SUPPRESSOR

Donald L. Olson, Minneapolis, Minn., assignor to Tennant Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 72,826, Sep. 6, 1979, abandoned. This application Sep. 9, 1980, Ser. No. 185,651
Int. Cl.³ A47L *11/204*
U.S. Cl. 15—320 **19 Claims**



1. A scrubbing machine comprising:

a body;

wheels rotatably affixed to said body;

tank means for containing scrubbing solution, said tank means comprising a single recovery tank;

means for conveying said solution from said tank means to the surface to be scrubbed;

means for working the solution on the surface;

vacuum squeegee means for recovering said solution from the scrubbed surface;

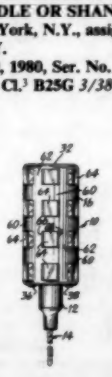
means for conveying said solution from said squeegee means to said tank means; said conveying means including a vacuum fan and duct means, said vacuum fan providing sufficiently high velocity to pick up said solution from the surface, said velocity being sufficiently great that substantial foaming would occur in said tank means if said velocity were maintained throughout said duct means; said duct means having an entrance cross section area to an exit cross sectional area ratio sufficient to substantially reduce the necessary high velocity of the solution at the squeegee means to a critical lower velocity which minimizes foaming and spraying, wherein at least a portion of said duct means has a substantially uniformly increasing cross sectional area whereby said solution velocity is reduced sufficiently to avoid development of foam and spray as said recovered solution is conveyed to said tank means.

4,393,539

OVERHANDLE FOR ENCLOSING A DENTAL TOOL HANDLE OR SHANK

Bernard Weissman, New York, N.Y., assignor to Ipco Corporation, White Plains, N.Y.

Filed Dec. 9, 1980, Ser. No. 214,664
Int. Cl.³ B25G *3/38*
U.S. Cl. 16—114 R **15 Claims**



1. An overhandle for enclosing a cylindrical end portion of a rotatable dental tool, comprising:

two mating semi-cylindrical elongated first and second sections having respective first and second forward end faces, said forward end faces being confrontingly opposed to each other in an opened condition of said overhandle, and said forward end faces being in a single plane in an assembled closed condition of said overhandle with said sections disposed against each other to define an elongated cylindrical body capable of being rotated;

a pair of hinges interconnecting said forward end faces to provide a one piece construction and to permit said sections to pivot from said opened condition to said closed condition;

an elongated channel respectively provided in each of said sections to define first and second channels, each of said channels extending respectively through said first and second forward end faces, said channels being in axial alignment with each other in said opened condition, said channels matingly confronting each other in said assembled closed condition to define an internal chamber with a forward end having an opening therethrough, said chamber receiving the cylindrical end portion of the tool therein with a remaining portion of the tool axially extending through said chamber opening in said forward end;

said hinges being spaced apart with one of said hinges being disposed on one side of said chamber opening and the other hinge being disposed on an opposite side of said chamber opening to permit the remaining portion of the tool to extend between said hinges without any interference therefrom;

first means in at least one of said sections for preventing axial extraction of the end portion of the tool from said chamber;

second means in at least one of said sections for rotating the end portion of the tool when said overhandle is rotated;

releasable coupling means for retaining said sections together in said assembled closed condition to enclose the end portion of the tool therein and for permitting said sections to be pivoted into said opened condition to remove the end portion of the tool therefrom;

said sections having respective first and second rear end portions including rear end faces remote from said forward end faces to provide said overhandle with a rear end when in said assembled closed condition; and

said coupling means including at least one locking member extending outwardly from said first rear end portion, and at least one recess located in a corresponding position in said second rear end portion for receiving said locking member in said assembled closed condition.

4,393,540

DETACHABLE HANDLE HAVING A PIVOTAL PART

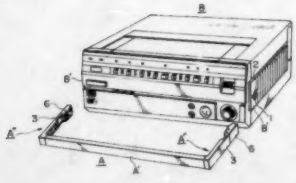
Toshiharu Yamamoto; Manabu Sato, both of Yokohama; Katsuya Akiba, Abiko, and Koreyoshi Abe, Matsudo, all of Japan, assignors to Victor Company of Japan, Limited, Tokyo, Japan

Filed Jul. 15, 1981, Ser. No. 283,552

Claims priority, application Japan, Jul. 16, 1980, 55-100335[U]

Int. Cl.³ B25G *3/18*

U.S. Cl. 16—114 R **4 Claims**



1. A detachable carrying handle comprising a web section and a pair of parallel limb sections extending in a longitudinal direction for carrying a portable equipment, said portable equipment having on each side thereof facing each of said limb sections a recess and a projection, the projection on one side is aligned along an axis with the projection on the other side, each of said limb sections including a first part connected at one end to said web section and a separate second part pivotally connected to the other end of said first part, said first part including a pin for transversely releasably engaging into said recess of said equipment and a longitudinally extending recess, said projection being inserted into the longitudinal recess and then slidably moved in the longitudinal direction in the longitudinal recess when said handle is moved in a direction parallel to the longitudinal direction to thereby maintain said handle in an upright position conjointly with said pin while allowing said handle to pivotally rotate about the axis when said pin is disengaged from said equipment recess, and means for urging the portion of said second part adjacent to said first part toward said equipment, said second part being engageable with said projection after said projection is inserted and slidably moved in the longitudinal direction in said longitudinal recess to prevent said handle from detaching from said equipment recess if said handle is moved in a direction opposite to the longitudinal direction and disengageable from said projection when pviotally rotated about a pivot against said urging means to allow said handle to be detached from said equipment by being moved in a direction opposite to the longitudinal direction.

4,393,541

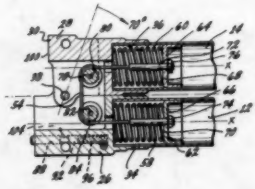
HINGE FOR DEPLOYABLE STRUCTURES SELF LOCKING HINGE

Edward J. Hujsak, La Jolla, and Hans M. Stocker, San Diego, both of Calif., assignors to General Dynamics Corporation/-Convair Div., San Diego, Calif.

Filed Feb. 19, 1980, Ser. No. 122,752

Int. Cl.³ E05F *1/12*

U.S. Cl. 16—297 **11 Claims**



1. A hinge having structural members attached thereto for positioning said structural members in a folded, back-to-back position and in an aligned deployed position comprising,

a pair of hinge members pivotly connected together, said hinge members form a bifurcated hinge construction,

biasing means connecting hinge members together and biasing said hinge members in both a folded and an unfolded position, said biasing means is located on the center line of said structural members and wherein said pivotal connection is offset said center line and located to allow said hinge members to fold to a position where said hinge members are back-to-back,

a trigger mechanism and a locking mechanism on said hinge members,

said trigger mechanism holding said locking member in an inoperative position when said hinge is in all but its unfolded position and triggering said locking mechanism to lock said hinge members together when said hinge is in its unfolded position.

4,393,542

POLYCENTRIC HINGE FOR CAST-BRACES

Gonzalo Martinez, P.O. Box 12304, Bogotá, Colombia

Filed Jul. 21, 1980, Ser. No. 170,485
Int. Cl.³ E05D 7/00
U.S. Cl. 16—369 3 Claims

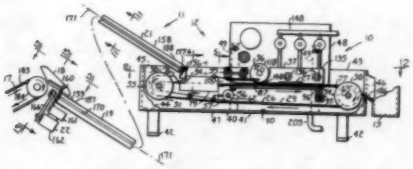
1. A hinge for a knee brace including an elongated element attachable to a leg above the knee and a further elongated element attachable to the leg below the knee, said element being interconnected by a multi-flexible linkage comprising individual links pivotally interconnected in zig-zag manner and a cable anchored at one end to one of said elongated elements and threaded through the zig-zag links.

4,393,543

SHRIMP PROCESSING AND HANDLING APPARATUS

Roger C. Martin, 1392 Lenora Dr., Merritt Island, Fla. 32952

Filed Jun. 12, 1981, Ser. No. 272,901
Int. Cl.³ A22C 29/00
U.S. Cl. 17—72 19 Claims



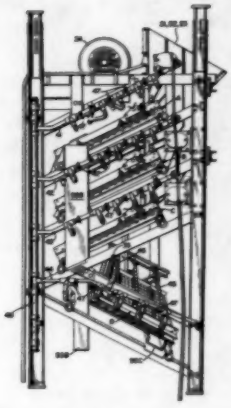
1. A mechanism for orienting shell bearing curled shrimp body parts and for successively discharging the oriented body parts therefrom comprising a pair of elongated inclined cylindrical rolls that are laterally spaced apart and arranged in parallel to define a channel in which the body parts are received and supported during the orientation thereof, said channel being inclined and having an upper end at which the body parts are received, and a lower end from which the body parts are discharged, each of said cylindrical rolls having a smooth cylindrical surface, means for rotatably driving said rolls in opposite directions that provide for the upward passage of the cylindrical surfaces thereof at the space between said rolls, means for feeding randomly arranged shell bearing curled shrimp body parts into the channel at said upper end, at least one of said cylindrical rolls having an elongated narrow groove in its cylindrical surface; said elongated groove being arranged in parallel with the axis of rotation of said one roll and during each revolution thereof to facially confront at the space between the rolls a portion of the smooth cylindrical surface of the other of said rolls, said one roll having a ledge forming surface that projects generally radially inwardly of the smooth cylindrical surface thereof and defines the trailing side of said groove; said ledge being arranged when said rolls are being driven to encounter the lower side edge of the shell of a shrimp body part that is supported on the rolls with its ventral side confronting said space therebetween and to flip the encountered body part over onto its dorsal side in the channel defined by said rolls.

4,393,544

KRILL PEELING MACHINE

James M. Lapeyre, New Orleans, La.; Noel A. Svendsen, Marblehead; Raymond J. Carroll, Jr., Pinehurst, both of Mass.; Henry H. Long, River Ridge, La., and Richard S. Lindberg, Shrewsbury, Mass., assignors to The Laitram Corporation, New Orleans, La.

Filed Feb. 2, 1981, Ser. No. 230,709
Int. Cl.³ A22C 29/02
U.S. Cl. 17—73 10 Claims



1. A krill peeling machine comprising:

a bank of pairs of peeling rolls having peeling nips therebetween with their major axes transverse to the path of flow of a supply of krill to be peeled,

means for oscillating said peeling rolls causing said nips to engage and peel krill,

said banks of peeling rolls being at a declination from the horizontal of from 20° to 30° and having a loading and discharge end,

leveling means at the loading end of said peeling bank for distributing the krill substantially evenly across the peeling nips of the rollers to provide a layer of krill in contact with the peeling nips,

krill longitudinal guide means spaced transversely along the major axes of the peeling rolls to maintain a uniform distribution of krill transversely of the axes of the peeling rolls,

and water means positioned to supply water means so that the water acts as a peeling lubricant between the krill and peeling nips and also as a conveyor to promote progress of the krill down the bank of peeling rolls as a fluid conveyor bed the speed of progress of which can be varied depending on the size and age of the krill.

4,393,545

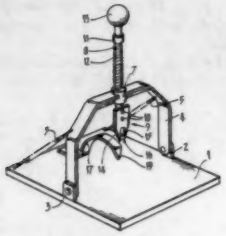
PROCESSING OF SEA URCHINS

Brian F. O'Donnell, 4 Nerissa St., Burwood, 31325, Victoria, Australia

Filed Dec. 2, 1980, Ser. No. 212,330
Claims priority, application Australia, Dec. 4, 1979, PE1598
Int. Cl.³ A22C 29/04
U.S. Cl. 17—76 8 Claims

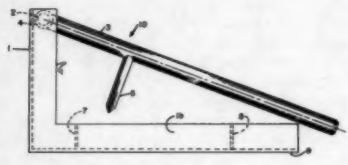
1. A tool for cracking the shells of sea urchins and like shelled creatures, characterised by a blade formed with a central recess which enables the blade to penetrate the shell of the

sea urchin in the region of the mouth thereof without causing significant damage to the internal organs or roe of said sea



urchin, said blade having cutting edges extending upwardly and outwardly from either side of said recess.

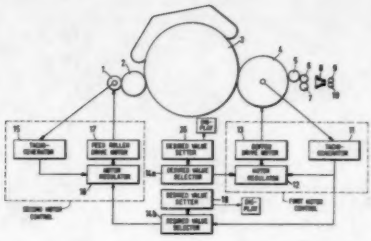
4,393,546
OYSTER SPLITTER
Jorge M. Ruiz, Rte. 1, Box 30, Fletcher La., Walker, La. 70785
Filed Sep. 18, 1981, Ser. No. 303,401
Int. Cl.³ A22C *29/04*
U.S. Cl. 17—76 **1 Claim**



1. A device for splitting oyster and clam shells, comprising:
(a) a support, which includes a base and a frame, the base further including an enclosure for positioning the oyster or clam; and
(b) shell-splitting means including a first bar pivotally connected to the frame, and a second bar substantially perpendicular to the first bar, one end of the second bar fastened to the first bar, the second bar including at its other end a hard, substantially conical edge; the first bar fastened to and substantially perpendicular to a third bar which is coaxial with a bearing fastened to the frame, whereby the first bar is capable of free rotation about the axis of the third bar.

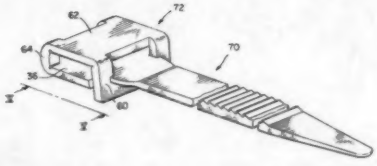
4,393,547
METHOD AND APPARATUS FOR THE OUTPUT CONTROL IN A CARDING MACHINE
Fritz Hosel, Monchengladbach, Fed. Rep. of Germany
Filed Nov. 3, 1980, Ser. No. 203,677
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1979, 2944428
Int. Cl.³ D01G *15/40, 15/48;* D01H *5/42*
U.S. Cl. 19—105 **8 Claims**

1. In a carding machine including a doffer, a first motor for driving said doffer, a feed roller and a second motor for driving said feed roller; the improvement comprising an apparatus for controlling the output and the sliver density in said carding machine; said apparatus having
(a) a first motor regulator connected to said first motor;
(b) a second motor regulator connected to said second motor;
(c) a first desired value setter for said doffer, connected to said first motor regulator;
(d) a second desired value setter for said feed roller, connected to said second motor regulator;
(e) a memory connected to said first and second desired value setters for feeding setting signals therefrom into said memory;



(f) a first switch having first and second positions for selectively connecting said first motor regulator to said first value setter or to said memory; and
(g) a second switch having first and second positions for selectively connecting said second motor regulator to said second value setter or to said memory.

4,393,548
FOLDED HEAD CABLE TIE AND METHODS FOR MAKING AND USING THE SAME
Philip J. Herb, Somerville, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.
Filed Aug. 4, 1980, Ser. No. 175,263
Int. Cl.³ B65D *63/00*
U.S. Cl. 24—16 PB **16 Claims**

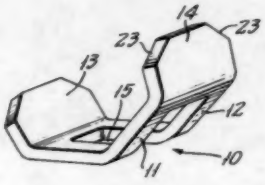


1. A self-latching tie comprised of a resilient elongate member having an end extent of folded walls defining a box-like head, said member having a body extent extending integrally and continuously with one wall of said head through an opening in another wall of said head and defining a tail, said head having a longitudinal passage therethrough bounded on opposed sides by walls of said member end extent inclusive of said one wall for receiving said tail, said head and said tail having respective complemental engagement means for securing said tail in such head passage.

4,393,549
SUPPORT CLIP FOR A DROPWIRE OR THE LIKE
Ignazio Leonardo, Mountainside, N.J., assignor to Diamond Communication Products, Inc., Garwood, N.J.
Filed Sep. 29, 1981, Ser. No. 306,857
Int. Cl.³ F16G *11/02*
U.S. Cl. 24—115 A **6 Claims**

1. As an article of manufacture, a support clip for a dropwire or the like, comprising a formed unitary blank of ductile metal sheet, the planiform of the blank being a peripherally continuous elongate rectangular frame surrounding a central open rectangular window region, said frame comprising two elongate parallel legs and two short end legs integrally connecting the longitudinal ends of said elongate legs, the length of said elongate legs along the length of said window region being at

least twice the length of said short end legs along the width of said window region, like longitudinally central obtuse-angle bends in each of said elongate legs, whereby the span between end legs is less than the length of said elongate legs but is nevertheless greater than the length of said short end legs, the width of said window being sized for accommodation of the width of dropwire to be secured to a support and said span between end legs being greater than the combined double



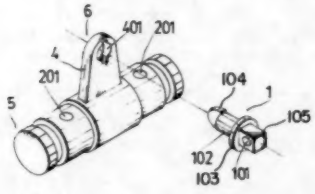
thickness of the dropwire, whereby a loop of the dropwire may be inserted through the window within said span with portions of the dropwire on both sides of the loop in adjacency to the combined extent of double the dropwise thickness, further whereby the clip may then be secured by crimping said end legs toward each other to reduce said span and in compressed squeezing engagement with said dropwire portions to permanently retain the loop, with said longitudinally central bends permanently reduced from said obtuse angle.

4,393,550

SAFETY CLASP FOR THE STRING OF FOOTWEAR

James Yang, and James M. F. Chen, both of No. 206, Li Hsing Rd., Taichung City, Taiwan

Filed Apr. 20, 1981, Ser. No. 255,369
Int. Cl.³ F16G *11/00*
U.S. Cl. 24—117 **2 Claims**



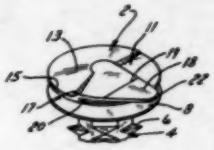
1. A safety clasp for the string of footwear comprising a fastening member and a knot member, said knot member having a lower portion transversely perforated with a hole, an extending rod portion, and a flat protruding head the height of which is larger than the diameter of said extending rod portion, said extending rod portion being between said lower portion portion and said flat protruding head; said fastening member comprising a tube having two bores, a compression spring within said tube, a pin at each end of said tube biased by said spring, and each pin having a bore substantially corresponding in size to said bore of said tube, and a mount perpendicular to said tube, said mount having a shaped perforation corresponding in size to the thickness of said flat protruding head and to the diameter of said extending rod portion so as to receive said flat protruding head and extending rod portion of said knot member therethrough as in the form of a keyed rod, whereby a knot is obtained by passing the opposite ends of said string of the footwear through the aligned bores of said tube and said pins upon said pins being depressed in said tube and further passing said ends in an opposite direction through the perforation in said lower portion of said knot member, and still further inserting said head of said knot member through the perforation of said mount; and said knot member being detachable from said mount by adjusting said flat protruding head in alignment with said shaped perforation of said mount.

4,393,551

ROTATABLY ENGAGING HEAD FOR FASTENER

Burnell J. Wollar, Barrington, Ill., and Richard J. Schwind, Akron, Ohio, assignors to Phillips Plastics Corp., Phillips, Wis.

Filed Aug. 25, 1980, Ser. No. 181,139
Int. Cl.³ A44B *17/00*
U.S. Cl. 24—213 R **5 Claims**



1. In a resilient fastener for attaching a complementary panel member to a support member, said panel member and said support member each including an aperture, said fastener comprising: a head of larger diameter than said panel member aperture, said head including an upperside, an underside and a circumferential edge; a shank extending from said underside of said head; said head having a slit extending radially inwardly from said circumferential edge of said head; and a lead-in tongue spaced above and generally parallel to said upperside of said head, said lead-in tongue being connected to said upperside of said head along one side of said slit for the introduction of said head into and through said panel member aperture as said fastener is rotated relative to said panel member aperture, said lead-in tongue circumferentially overlapping and substantially covering said slit for its entire length and overlapping a portion of said upperside of said head.

4,393,552

JEWELRY CLASP RETAINING MEMBER

Charles Frankel, Brooklyn, N.Y., assignor to Laurel Enterprises, Rahway, N.J.

Filed Jan. 5, 1981, Ser. No. 222,531
Int. Cl.³ A44B *11/25*; A44C *5/18*
U.S. Cl. 24—213 C **9 Claims**

1. In a jewelry clasp having a female housing, a male member for insertion into said housing, and locking means for releasably locking said male member within said housing, an improvement comprising:

retaining means mounted on said male member for effecting unidirectional passage of said male member through a jewelry mounting aperture associated with an article of jewelry so that the article of jewelry is retained on a chain connected to said male member;

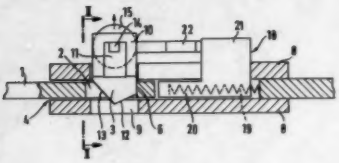
said retaining means including a resilient clip; and

said clip including outwardly bowed resilient sections laterally extending from opposing sides of said male member.

4,393,553
LOCKING DEVICE FOR A SAFETY BELT

Franz Wier, Göggingen, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 237,921
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1980, 3006939
Int. Cl.³ A44B 11/25
U.S. Cl. 24—230 AL 5 Claims

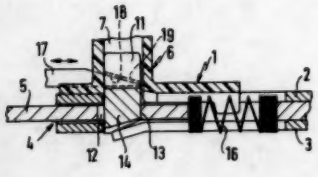


1. Locking device for a safety belt comprising a belt lock having two spaced plates defining an insertion path, a plug-in tongue attached to a belt for insertion in the insertion path, a latch movable transversely to the direction of the insertion of the plug-in tongue to detent the inserted tongue, a pressure element movable manually against the force of a spring to move the latch transversely out of the detent position, a spring-activated sliding ejector disposed in the insertion path ahead of the tongue, a stop connected with the pressure element to halt the ejector from contacting the tongue when in the detent position, said stop movable with the pressure element and concurrently moves away from blocking said ejector when said pressure element moves said latch out of the detent position.

4,393,554
LOCKING DEVICE FOR SAFETY BELTS

Franz Wier, Göggingen, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 237,922
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1980, 3006972
Int. Cl.³ A44B 11/26
U.S. Cl. 24—230 AL 3 Claims

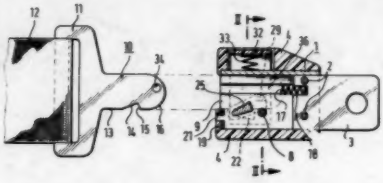


1. Locking device for a safety belt comprising a belt lock having two spaced plates defining an insertion path, a plug-in tongue attached to a belt for insertion in the insertion path, a latching bolt having an engagement surface movable transversely to the plug-in direction of the plug-in tongue to block withdrawal of the tongue by contact of said engagement surface with a straight edge surface of said plug-in tongue, said straight edge surface changing its shape upon the belt being subjected to a load and said engagement surface of said latch contoured to complement the shape of said edge surface under load to thereby provide increased contact area between said latching bolt and said plug-in tongue under load conditions.

4,393,555
BELT LOCK FOR A SAFETY BELT

Föhl, Schorndorf, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Apr. 1, 1981, Ser. No. 250,039
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012939
Int. Cl.³ A44B 11/26
U.S. Cl. 24—230 A 6 Claims

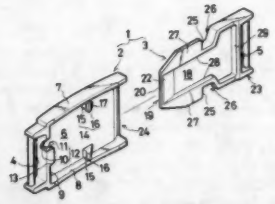


1. Lock for a safety belt comprising a belt lock having a lock-housing with an insertion path, a plug-in tongue with an engagement detent only at one side at a longitudinal edge for insertion in the insertion path of the lock-housing, a latch mechanism having a latch for engaging the detent of the plug-in tongue inserted in the insertion path, said tongue having a guide-profile at its forward end, seen in the profile direction, said insertion path having a mating surface which fits the guide-profile of said tongue only when correctly inserted, a pressure element movable against the force of a spring to move said latch out of engagement with said tongue to permit withdrawal of the tongue from the belt lock, and wherein the plug-in tongue is provided with a wart-like, stamped projection which is raised above the tongue's flat side, and which is guided loosely with play in a groove-like bulge in the housing.

4,393,556
PLASTIC BUCKLE

Takuo Yuda, Yokohama, and Akira Mizusawa, Fujisawa, both of Japan, assignors to Nifco, Inc., Tokyo, Japan

Filed Apr. 13, 1981, Ser. No. 253,325
Claims priority, application Japan, Apr. 18, 1980, 55-51812[U]
Int. Cl.³ B65D 63/00
U.S. Cl. 24—230 R 6 Claims



1. A plastic buckle comprising two discrete, totally separable half buckle members each having a longitudinal dimension and a lateral dimension, a first half buckle member having a belt-insertion slit along one lateral edge thereof and a second buckle member having another belt-insertion slit along one lateral edge thereof opposite said one lateral edge of said first buckle member, said first buckle member including a first snap engaging means and a fulcrum creating upstanding wall region formed near one lateral edge thereof including a retention ledge located at an uppermost extremity of the fulcrum creating upstanding wall region, said second buckle member includ-

ing a second snap engaging means adapted for snapping engagement with said first snap engaging means and fulcrum engaging portion formed near a lateral edge wherein said fulcrum engaging portion is adapted to be caught by said retention ledge, whereby the two buckle members are assembled into one complete buckle by positioning the fulcrum engaging portion of the second buckle member adjacent the fulcrum creating upstanding wall region with the first buckle member angularly disposed relative to the second buckle member, then rotating the two buckle members toward each other with the point of contact of the two buckle members serving as the fulcrum of rotation and snapping the two buckle members into fast union by resiliently engaging the first snap engaging means of the first buckle member with the second snap engaging means of the second buckle member.

4,393,557

SAFETY BELT BUCKLE

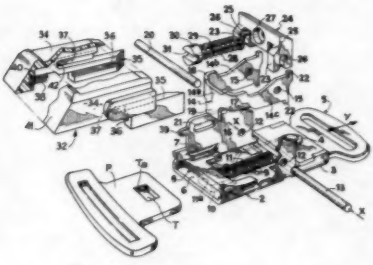
Yves Schmidt, Audincourt, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed May 13, 1981, Ser. No. 263,383

Claims priority, application France, May 14, 1980, 80 10826

Int. Cl.³ A44B *11/25*

U.S. Cl. 24—230 A **5 Claims**



1. In a safety belt buckle for attaching a portion of a safety belt to retaining means through a tongue member constituting a latch, said buckle comprising a case, a support for fixing to the retaining means and disposed in the case, the support having two spaced-apart walls, locking means for the latch, the locking means being disposed between said walls, articulation means mounting the locking means on said walls of the support so that the locking means are pivotable on said walls of the support about an axis, stop means movably mounted on the support, the locking means defining a first abutment surface cooperative with the latch to retain the latch in a locked position, the locking means defining a second abutment surface adapted to bear against the stop means, a control knob cooperative with the stop means for withdrawing the stop means and releasing the locking means, the support defining a complementary abutment surface, the locking means defining a third abutment surface adapted to be applied, in a locked position of the buckle, against said complementary abutment surface when a tensile force exceeding a predetermined value is exerted on the latch in a direction for extracting the latch; the improvement wherein said locking means define a predetermined space therebetween and each of said walls of the support, said articulation means project from opposite sides of the locking means and extend through said spaces and into said walls of the support whereby a force for shifting the locking means relative to said walls of the support in a direction perpendicular to said axis would elastically deform said articulation means on opposite sides of the locking means, spacer means being provided for maintaining said spaces between the locking means and said walls of the support so that, when said tensile force is exerted, said third abutment surface and said complementary abutment surface come in contact with each other by elastic deformation of said articulation means.

4,393,558

FASTENER FOR SHEET MATERIAL

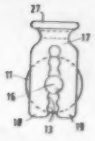
Karl J. Herwegh, and Rutger Modderkolk, both of Eerbeek, Netherlands, assignors to Nederlandse Pillo-Pak Maatschappij B.V., Eerbeek, Netherlands

Filed Jun. 15, 1981, Ser. No. 273,334

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024471

Int. Cl.³ A44B *19/00*

U.S. Cl. 24—230 R **7 Claims**



1. In a device for the detachable mounting of flexible sheets, comprising a plurality of molded members of synthetic resin, connectible in pairs with each other, clamping the sheet between them, wherein one molded member is adapted to be attached as the base part to a substrate and the other molded member can be detachably mounted on the base part, and wherein a spike for passing through the sheet extends from a base plate of the base part; the improvement in which the spike has a cylindrical spike body and an annular flange carrying a conical spike tip, and the other molded member is a slip-on member comprising a two-legged clamping fork, the fork legs of which are secured together at one end and spaced apart at the other end and have a least spacing from each other which is somewhat less than the outer diameter of the spike body, the inner lateral surfaces of said fork legs having at least one recess wherein the spike body locks into place when the legs of the clamping fork are slid lengthwise between said flange and said base plate with said legs straddling said spike body.

4,393,559

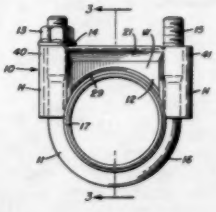
U-BOLT CLAMP WITH TUBULAR REINFORCING MEANS

John E. Heckethorn, Dyersburg, and Danny J. Whittle, Newbern, both of Tenn., assignors to Heckethorn Manufacturing Company, Dyersburg, Tenn.

Filed Jul. 14, 1981, Ser. No. 283,237

Int. Cl.³ B65D *63/00*

U.S. Cl. 24—277 **7 Claims**



1. A U-bolt clamp saddle body formed from a single folded blank of sheet metal, including a pair of spaced parallel U-bolt leg receiving housings, a central web section having an arcuate lower edge extending between said housing, and an integral tubular reinforcing rib extending from one said housing to the

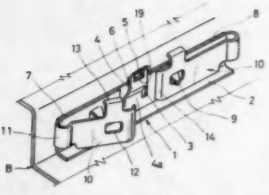
other on said web and forming the top face thereof, said reinforcing rib being of triangular cross section and having a planar top face between two of the verticies defined by said triangular cross section, the third vertex defined by said triangular cross section of said rib being located between the top face and said arcuate lower edge.

4,393,560

CLIP FOR RETAINING A WINDSHIELD MOLDING IN AN AUTOMOBILE

Yoshinori Kato, Aichi, Japan, assignor to Kabushiki Kaisha Togo Seisakusho, Japan

Filed Jun. 10, 1981, Ser. No. 272,225
Claims priority, application Japan, Jun. 28, 1980, 55-91203[U]; Apr. 15, 1981, 56-54910[U]
Int. Cl.³ B60J 1/00; E06B 3/58
U.S. Cl. 24—295 10 Claims



1. A clip for retaining a molding to a predetermined inside face of a window glass receiving frame in an automotive body comprising

a band-like support plate formed of an elastic material;

a flexible hook member formed integrally with said support plate for defining a space for insertion of said molding between said window glass receiving frame and said hook member, said hook member being elastically engageable with said molding;

a pair of wing plates formed at the outermost ends of said support plate, said wing plates being flexible relative to the center of said support plate;

means for releasably retaining said wing plates substantially parallel with the center portion of said support plate; and

means for disengaging said wing retaining means upon insertion of said molding into said space between said window glass receiving means and said hook member;

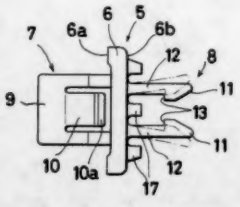
said wing clips having at least equal spring force as that of said hook member.

4,393,561

RADIATOR GRILLE FIXING STRUCTURE

Takuo Yuda, Yokohama, Japan, assignor to Nifco, Inc., Yokahama, Japan

Filed Jul. 2, 1980, Ser. No. 164,506
Claims priority, application Japan, Jul. 5, 1979, 54-91897[U]
Int. Cl.³ E04B 1/38
U.S. Cl. 24—297 3 Claims



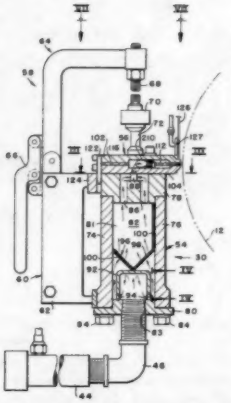
1. A fixing structure for fastening a radiator grille to an automobile body, comprising in combination a fastener composed of a base plate portion, at least one automobile body fastening means formed on one side of said base plate portion and adapted for snap engagement with the automobile body, at least one radiator grille fastening means formed on the other side of the base plate portion and adapted for snap engagement with the radiator grille, and three ribs comprising a first rib disposed diametrically of said recess and a pair of ribs spaced on either side of said first rib, each of said pair of ribs having an arcuate outer lateral surface and positioned surrounding said radiator grille fastening means, and a fastening attachment point formed on the radiator grille and provided with an opening formed opposite the radiator grille fastening means of the fastener and adapted to admit into snap engagement therewith said radiator grille fastening means, said radiator grille fastening attachment point having an annular recess adapted to admit the rib of the fastener into intimate contact therewith.

4,393,562

APPARATUS FOR IMPARTING VISUAL SURFACE EFFECTS TO RELATIVELY MOVING MATERIALS

Jimmy L. Stokes, Moore, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Jan. 23, 1981, Ser. No. 227,828
Int. Cl.³ D06C 23/00
U.S. Cl. 26—2 R 13 Claims



1. In apparatus for pressurized heated fluid stream treatment of a relatively moving substrate material to impart a change in the appearance thereof and including an elongate fluid distributing manifold assembly disposed across the path of relative movement of the material and closely adjacent the surface thereof for discharging at least one discrete stream of heated pressurized fluid against the surface of the material; the improvement wherein said manifold assembly comprises

first and second elongate manifold housings defining corresponding first and second fluid-receiving compartments extending across the path of relative movement of the material;

said first housing including inlet means for introducing pressurized heated fluid into said first compartment generally uniformly along its elongate length, outlet means located remotely from said inlet means for discharging heated fluid from the compartment generally uniformly along its elongate length, said first housing inlet and outlet means defining a flow path through said housing which is generally perpendicular to its length, the axis of fluid flow introduced into said first compartment by said inlet means and the axis of fluid flow discharged from said first compartment by said outlet means being substantially parallel;

said second manifold housing including inlet means for receiving pressurized heated fluid into said second com-

partment generally uniformly along its length, fluid stream discharge outlet means in said second housing for directing said at least one stream of fluid against the surface of the substrate material, said second housing inlet and outlet means defining a flow path of heated fluid through said housing which is generally perpendicular to its length;

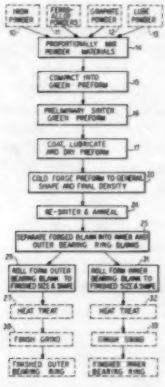
and means attaching said second housing to said first housing, with said outlet means of said first housing communicating with said inlet means of said second housing, and with the axis of discharge of said fluid stream discharge outlet means disposed at a substantially right angle to the heated fluid flow path through said first manifold housing.

4,393,563

COLD FORCED SINTERED POWDER METAL ANNULAR BEARING RING BLANKS

David T. Smith, 2619 W. Pratt Blvd., Chicago, Ill. 60645

Filed May 26, 1981, Ser. No. 266,931
Int. Cl.³ B21K *1/04*
U.S. Cl. 29—149.5 DP **13 Claims**


IRON POWDER
FERRO-ALLOY POWDER(S)
GRAPHITE POWDER
LUBE POWDER
PROPORTIONALLY MIX POWDER MATERIALS
COMPACT INTO GREEN PREFORM
PRELIMINARY SINTER GREEN PREFORM
COAT, LUBRICATE AND DRY PREFORM
COLD FORGE PREFORM TO GENERAL SHAPE AND FINAL DENSITY
RE-SINTER & ANNEAL
SEPARATE FORGED BLANK INTO INNER AND OUTER BEARING RING BLANKS
ROLL FORM OUTER BEARING BLANK TO FINISHED SIZE & SHAPE
ROLL FORM INNER BEARING BLANK TO FINISHED SIZE & SHAPE
HEAT TREAT
HEAT TREAT
FINISH GRIND
FINISH GRIND
FINISHED OUTER BEARING RING
FINISHED INNER BEARING RING

1. A method for the manufacture of improved bearing elements, without high temperature forming which comprises the following steps:

(1) combining (a) powders consisting substantially of iron with (b) ferro-alloy powders each containing a maximum of 80% by weight iron and the balance of each alloying powder being either manganese, nickel, chromium, molybdenum, or vanadium, (c) graphite powder, and (d) a lubricant,

(2) mixing the resulting combination,

(3) compacting the resulting mixture to produce a preform,

(4) pre-sintering the preform,

(5) coating the sintered preform with a stop-off coating and lubricant,

(6) cold forging the coated and lubricated preform to achieve a plastic deformation of at least 50%, through a combination of lateral and vertical flow and produce an article being at least 98% dense and approximating the shape of the finished article,

(7) resintering the cold forged shape,

(8) annealing the resintered shape, and

(9) roll forming the annealed and resintered shape into substantially final dimensions.

4,393,564

METHOD AND APPARATUS FOR REPAIRING HEAT EXCHANGERS

John E. Martin, Penllyn Pike, Springhouse, Pa. 19477

Filed Dec. 8, 1980, Ser. No. 214,189
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—157.3 C **15 Claims**

1. Apparatus for use in plugging a tube in a heat exchanger having a bundle of tubes mounted at opposite ends in spaced tube sheets comprising:

a plug assembly adapted to be installed inside one end of the tube in the zone of one of said tube sheets, said plug assembly including an expandable ring and a wedge mounted in the ring and slidable relative thereto to expand the ring radially outward against the inside of the tube;

breakaway means connected to said wedge and projecting into said tube;

pull rod means connected at one end to said breakaway means and extending lengthwise of said tube beyond the other of said tube sheets;

compression tube means engaged at one end with said ring and surrounding said pull rod means inside said heat exchanger tube and extending therealong from said ring into proximity with the other tube sheet;

ram means disposed adjacent said other tube sheet for applying tension to said pull rod means and compression to said compression tube means while maintaining said plug assembly aligned with its tube sheet;

whereby upon application of tension and compression the wedge is drawn into the ring until a predetermined outward pressure is reached causing the breakaway means to separate for affording withdrawal of the compression tube means and pull rod means from inside the heat exchanger tube.

4,393,565

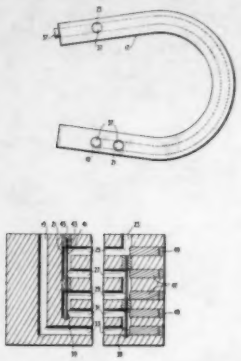
METHOD OF MAKING A WATER-COOLED ELECTRODE HOLDER

James G. Wilson, II, Huntington, and P. Fred Hammers, Barboursville, both of W. Va., assignors to Wilson Welding Company, Inc., Huntington, W. Va.

Division of Ser. No. 148,290, May 9, 1980, Pat. No. 4,342,878. This application Jun. 12, 1981, Ser. No. 272,888
Int. Cl.³ B23P *15/26;* **H05B** *7/105*
U.S. Cl. 29—157.3 R **4 Claims**

1. A method of making an electrode holder of the type comprising a U-shaped slab of metal with a circuitous passageway therethrough for the flow of cooling water, comprising blind drilling a plurality of straight holes at right angles to each other through two adjacent edges of a flat slab of metal with a plurality of said holes intersecting each other, bending said flat slab to U-shape in a direction such that the holes extending in one direction are bent to U-shape but the holes at right angles thereto remain straight and to an extent such that the legs of the U-shaped slab remain flat so that portions of the holes bent in a U-shape form straight passages, plugging the ends of said straight passages, and plugging certain of said holes that re-

main straight intermediate their length between certain adjacent U-shaped holes, in such a pattern as to leave a single



circuitous passageway through the slab having an inlet end and an outlet end opening edgewise through the slab.

4,393,566

PROCESSING OF COPPER TUBING

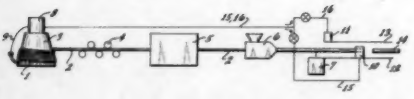
Otto Uhlmann, Burgdorf, and Klaus-Peter Uhlmann, Bad Iburg, both of Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte AG, Hanover, Fed. Rep. of Germany

Filed Dec. 30, 1980, Ser. No. 221,297

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1980, 30036

Int. Cl.³ B23P *17/00;* **B21B** *9/00*

U.S. Cl. 29—417 **26 Claims**



15. A method for processing copper tubing following sizing under utilization of a drawing oil, comprising the steps of

passing copper tubing through a furnace for annealing, whereby drawing oil deposits evaporate;

applying suction to the trailing end of the tubing so that evaporated oil deposits are removed through said trailing end; providing another such tubing having a front and a trailing end;

connecting the front end to the trailing end of the first-mentioned tubing under utilization of a hollow plug in order to obtain a string of tubing;

applying suction to the trailing end of the other tubing so that vapors can be removed through the latter's end;

continuing the annealing during the connecting step, and repeating the providing, connecting, and applying steps to obtain a continuous process on a continuous string of tubing; and

cutting the resulting, continuous string of tubing into shorter lengths.

4,393,567

METHOD AND APPARATUS FOR THE ASSEMBLY OF LONG OBJECTS ON A ROTATING SHAFT

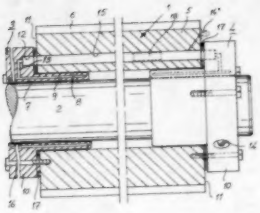
Lennart Disborg, Linköping, Sweden, assignor to FFV Industriprodukter AB, Eskilstuna, Sweden

Filed Sep. 15, 1981, Ser. No. 302,276

Claims priority, application Sweden, Oct. 17, 1980, 8007313

Int. Cl.³ B23P *17/00, 11/02;* **F16D** *19/00*

U.S. Cl. 29—421 R **14 Claims**



1. Method for the assembly of long objects on a rotating shaft by using two expander bushings of the kind made up of a sealed body with an inner collar and an outer collar which form a pressure cavity between them filled with a pressure medium, and which has a means for pressurizing the pressure medium in the pressure cavity, and where the expander bushings each have a flange arranged to lie against each end surface of the long object which shall be assembled, characterized by that an axial hole is recessed partially into the flange of each expander bushing from the surface directed towards the collars, the hole being connected to a channel leading to the pressure cavity, and a corresponding axial hole is led through the long object which shall be assembled, and the expander bushings are first assembled to the end surfaces of the long object so that the expander bushings axial hole coincides with the axial hole through the long object, the axial holes and channels being filled with the same pressure medium as in the pressure cavity, whereby a hydraulic system is established between the unit comprising the expander bushings and the long object which shall be assembled.

4,393,568

METHOD FOR ATTACHING WOODEN FORMS TO A CONCRETE SURFACE

Ramon Navarro, 10138 E. Rush St., South El Monte, Calif. 91733

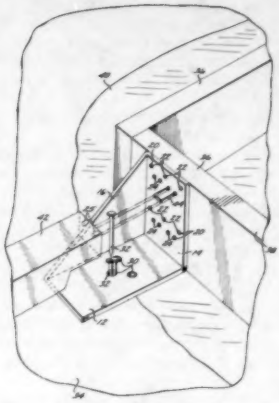
Division of Ser. No. 30,071, Apr. 16, 1979, abandoned. This application Jun. 1, 1981, Ser. No. 268,755

Int. Cl.³ B23P *11/00*

U.S. Cl. 29—432 **4 Claims**

1. A method of forming a tilt-up concrete wall panel comprising: aligning wooden form members on a horizontal slab of set concrete to define a length and width of a tilt-up concrete panel, placing a plurality of brackets in abutment with the exterior surfaces of the wooden form members, each of the brackets having a vertical side plate abutting the outer surface of the adjacent wooden form member and a horizontal base plate perpendicularly disposed relative to the side plate and extending outwardly from the adjacent wooden member in abutment with the top surface of the horizontal slab, said vertical side plate having a first pair of alignment apertures and a second pair of staple receiving apertures, driving a fastener through an aperture in the base plate to attach the base plate to the horizontal slab, positioning a pair of alignment probes of a

staple gun into said first pair of apertures to align a staple with said second pair of apertures, and driving said staple through



said second pair of apertures in the side and plate into the adjacent wooden form member.

4,393,569

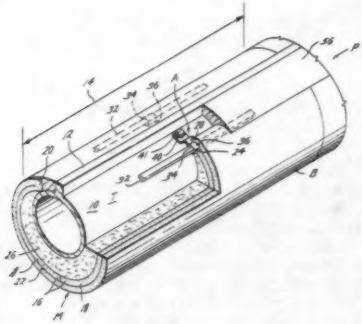
METHOD OF INSTALLING DEFRACTORY CERAMIC FIBER MODULE

Carlisle O. Byrd, Jr., Houston, Tex., assignor to J T Thorpe Company, Houston, Tex.

Division of Ser. No. 146,116, May 2, 1980, abandoned. This application Jun. 26, 1981, Ser. No. 277,877

Int. Cl.³ B23P *3/00, 19/04*

U.S. Cl. 29—460 **13 Claims**



1. A method of installing refractory ceramic fiber module, composed of a folded blanket of refractory ceramic fiber extending between two end folds and having attachment members extending outwardly from said folds, to a support tube which supports a metal member during movement of the member in a furnace comprising the steps of:

(a) wrapping the blanket of the module about the tube; and

(b) attaching the attachment members to the tube.

4,393,570

METHOD OF AND APPARATUS FOR CUTTING STRIPS FROM LONG PLATES

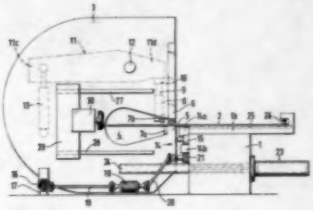
Georg Frick, Günzburg; Harro Reiff, Leipheim, and Alois Kirsch, Günzburg, all of Fed. Rep. of Germany, assignors to Karl Mengele & Söhne Maschinenfabrik und Eisengiesserei GmbH & Co., Gunzburg, Fed. Rep. of Germany

Filed Dec. 12, 1980, Ser. No. 215,643

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1979, 2950555

Int. Cl.³ B26D *11/00;* **B23D** *15/04*

U.S. Cl. 29—560 **14 Claims**



1. Method for cutting strips from long plates such as sheet metal plates including supporting a plate to be cut at a cutting station on an elongated stationary support surface, forming a cutting line along the length of the plate extending along an edge of the support surface, movably positioning a shear stand along the length of the plate in the cutting station adjacent the side of the plate from which a cut strip is to be cut and along the edge of the stationary support surface, providing a movable cutter and a stationary cutter on the shear stand with the movable cutter having a length which is relatively short compared to the length of the support surface so that the length of the support surface is a multiple of the length of the movable cutter, arranging the shear stand at one end of the cutting line and displacing the movable cutter toward the stationary cutter to effect a first cut, moving the movable cutter away from the stationary cutter and then moving the shear stand for the dimension corresponding to the length of the movable cutter for making the next cut, moving the movable cutter toward the stationary cutter to effect a second cut continuing from the first cut and repeating the steps of moving the shear stand and then moving the movable cutter toward the stationary cutter until a length of plate has been completely cut, releasably holding the portion of said plate to be cut adjacent to and outwardly from the edge of the support surface as the movable cutter is moved toward the stationary cutter and releasing the cut portion after the cutting action has been completed, clamping the opposite side of the plate from the side being cut and holding the plate during the continuation of the cutting operation, and supporting the portion of the plate already cut during the continuation of the step-wise cutting operation along the length of the plate to be cut.

4,393,571

APPARATUS FOR PRODUCING AN ARC WELDED SLEEVE

Werner Sturm, Allerheiligenstr. 624, Hägendorf, Switzerland

PCT No. PCT/CH79/00079, § 371 Date Jan. 29, 1980, § 102(e) Date Jan. 10, 1980, PCT Pub. No. WO79/01140, PCT Pub. Date Dec. 27, 1979

PCT Filed May 29, 1979, Ser. No. 192,526

Claims priority, application Switzerland, May 29, 1978, 5858/78

Int. Cl.³ B23P *22/00*

U.S. Cl. 29—564.6 **7 Claims**

1. An apparatus for forming a welding sleeve of the type having a coil of electrical resistance heating wire in spaced, juxtaposed turns embedded in the inner wall of a thermoplastic

sleeve member and surrounding a cylindrical coil former, comprising

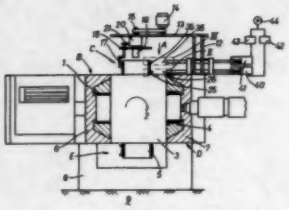
means at opposite ends of the coil former defining first and second clamp members;

means for winding the coil of wire around the former so that the windings extend from said first clamp member to said second clamp member;

first and second clamping bodies;

means for supporting said clamping bodies for movement toward and away from said first and second clamp members, respectively, so that said first clamping body can be moved to engage said first clamp member after the wire has been placed on said first member to attach the wire thereto, and said second clamping body can be moved to engage said second clamp member after the wire has been placed on said second member to attach said wire thereto; and

means operatively associated with said second clamping body for severing said wire after attachment thereof to said second clamp member.



4,393,572

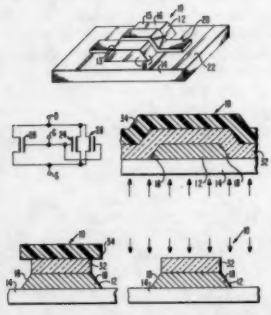
METHOD OF MAKING LOW LEAKAGE N-CHANNEL SOS TRANSISTORS UTILIZING POSITIVE PHOTORESIST MASKING TECHNIQUES

Steven G. Policastro, Readington Township, Hunterdon County, and Dae-Shik Woo, Hillsborough Township, Somerset County, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 29, 1980, Ser. No. 154,601

Int. Cl.³ H01L *21/86, 21/20*

U.S. Cl. 29—571 **8 Claims**



1. An improved method for forming an SOS FET device having source and drain regions of a given conductivity type, comprising the steps of:

(i) epitaxially growing a silicon layer on the top side of a sapphire substrate;

(ii) forming a masking layer on the surface of the silicon layer, the masking layer covering the area of the silicon layer where at least one island which will be used for forming a transistor is located; and

(iii) removing the portions of the epitaxial silicon layer which are not under the masking layer in order to leave the islands on the top side of the sapphire substrate;

wherein the improvement comprises:

(a) forming a transparent masking layer over the surface of the silicon island and the exposed portions of the sapphire substrate between the islands;

(b) applying a positive photoresist layer over the top surface of the transparent masking layer;

(c) exposing the photoresist layer from the underside of the substrate, whereby only those portions of the photoresist layer which overlie the edges of the islands and those portions of the photoresist layer which lie between the islands will be exposed, but only those portions of the photoresist layer which overlie the top surface of the islands will not be exposed through the islands;

(d) developing the photoresist layer;

(e) removing only those portions of the transparent masking layer which are on the sides of and between the islands that are exposed when the photoresist layer is developed;

(f) removing the photoresist layer remaining on the unremoved portions of the transparent masking layer; and

(g) implanting conductivity modifying ions of a type opposite to that of the source and drain regions into the exposed edges of the islands.

4,393,573

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE PROVIDED WITH COMPLEMENTARY SEMICONDUCTOR ELEMENTS

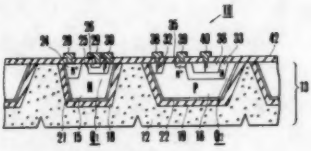
Kotaro Kato, Chofu, and Tetsuma Sakurai, Hachioji, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Aug. 26, 1980, Ser. No. 181,357

Claims priority, application Japan, Sep. 17, 1979, 54/117873; Mar. 4, 1980, 55/26177; Apr. 14, 1980, 55/48555

Int. Cl.³ H01L *21/223*

U.S. Cl. 29—571 **5 Claims**



1. A method of manufacturing a compound semiconductor device comprising the steps of:

applying a first mask layer onto one major surface of a semiconductor substrate except a first local region, said first mask layer having an upper layer and a lower layer of the same material and an intermediate layer of a different material having a first etching speed;

forming a first semiconductor layer of a first conductivity type on the entire surface of said substrate by an epitaxial growth process, said first semiconductor layer including a single crystalline layer grown from said first local region of said semiconductor substrate, and a polycrystalline layer grown from said first mask layer;

forming a second mask layer of said same material on a portion of said first semiconductor layer corresponding to said first local region, said second mask layer being etchable by a solution which barely etches said intermediate layer and being substantially thicker than said lower layer of said first mask layer;

etching said first semiconductor layer by using said second mask layer so as to leave only said single crystalline layer

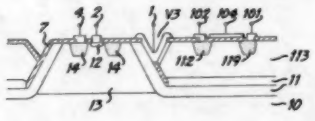
having inclined surfaces determined by a crystal structure of said single crystalline layer;
removing said second mask layer;
forming a layer containing an impurity of the first conductivity type at a high concentration over the entire outer surface of said single crystalline layer;
forming a first insulating layer on said single crystalline layer;
removing said first mask layer;
forming a second semiconductor layer of a second conductivity type over the entire surface of the substrate by epitaxial growth process, said second semiconductor layer including a polycrystalline layer grown from said first insulating layer and a single crystalline layer grown from said semiconductor substrate;
selectively forming a third mask layer on the single crystalline layer of the second semiconductor layer;
etching said second semiconductor layer by using said third mask layer so as to leave a single crystalline layer of the second semiconductor layer on a second local region of the semiconductor substrate thereby forming inclined surfaces determined by crystal structure of said semiconductor substrate;
removing said third mask layer;
forming a layer containing at a high concentration an impurity of the second conductivity type on the entire outer surface of the remaining single crystalline layer of said second semiconductor layer and exposed surface of said substrate;
forming a second insulating layer on a surface containing the remaining single crystalline layer of said second semiconductor layer and exposed surface of said substrate;
forming a polycrystalline semiconductor layer on said surfaces of said first and second insulating layers;
removing said semiconductor substrate; and
forming semiconductor elements having complementary characteristics in respective exposed single crystalline layers by utilizing a surface formed by polishing as a major plane.

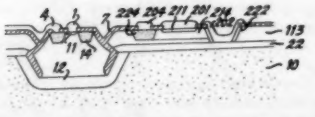
4,393,574

METHOD FOR FABRICATING INTEGRATED CIRCUITS

Masafumi Shimbo, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Dec. 5, 1980, Ser. No. 213,617
Int. Cl.³ H01L *21/205, 21/208*
U.S. Cl. 29—571 5 Claims





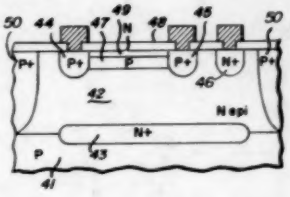
1. A method for fabricating integrated circuits comprising the steps of:
forming a concave portion having bottom and side faces on a semiconductor single-crystal substrate;
forming an insulating film on the faces of said concave portion except for at least one portion of the bottom face of said concave portion;
forming a first semiconductor growth layer on the bottom face of said concave portion which is free of the insulating film by chemical vapor deposition using a mixture gas containing semiconductor chloride and hydrogen such that the top surface of the growth layer is at the same level as the upper face of the substrate in the region adjoining said concave portion; and,
fabricating semiconductor devices in said substrate and said growth layer.

4,393,575

PROCESS FOR MANUFACTURING A JFET WITH AN ION IMPLANTED STABILIZATION LAYER

James L. Dunkley, Santa Clara, and Robert C. Dobkin, Atherton, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 19,135, Mar. 9, 1979, abandoned, which is a continuation of Ser. No. 716,049, Aug. 20, 1976, abandoned, which is a continuation of Ser. No. 575,418, May 7, 1975, abandoned, which is a continuation of Ser. No. 377,611, Jul. 9, 1973, abandoned. This application Jul. 20, 1981, Ser. No. 284,664
Int. Cl.³ H01L *21/265*
U.S. Cl. 29—571 8 Claims



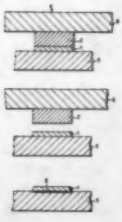
1. The method of stabilizing the surface of a junction field effect transistor having a gate region of a first conductivity type material in a semiconductor body, a source region and a drain region of a second conductivity type material in said semiconductor body, and channel region of said second conductivity type in said gate region and between said source region and said drain region comprising the step of forming a stabilization region over said channel region by ion implantation of a shallow layer material of said first conductivity type.

4,393,576

METHOD OF PRODUCING ELECTRICAL CONTACTS ON A SILICON SOLAR CELL

Reinhard Dahlberg, Flein, Fed. Rep. of Germany, assignor to Licenta Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 2, 1981, Ser. No. 298,927
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 3036260
Int. Cl.³ H01L *31/18*
U.S. Cl. 29—572 7 Claims



1. A method of producing electrical contacts on a silicon solar cell, comprising: stamping out a metal film or foil adhering to one side of a carrier together with the carrier in the shape of the contacts; and applying the stamped contact film or

foil to the silicon so as to be detached from the carrier and to adhere to the silicon surface.

4,393,577

SEMICONDUCTOR DEVICES AND METHOD OF MANUFACTURING THE SAME

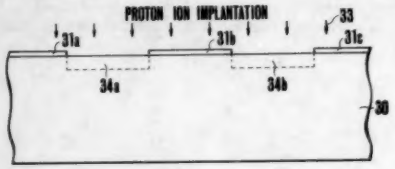
Kazuo Imai, Tokyo, Japan, assignor to Nippon Telegraph & Telephone Public Corp., Japan

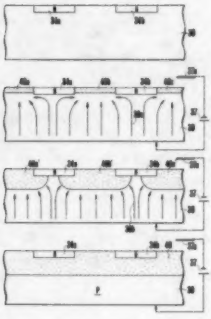
Division of Ser. No. 84,627, Oct. 12, 1979, abandoned. This application Dec. 11, 1981, Ser. No. 329,759

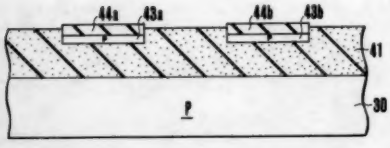
Claims priority, application Japan, Oct. 27, 1978, 53-132253; Oct. 27, 1978, 53-132254; May 24, 1979, 54-63252; Jun. 4, 1979, 54-69001

Int. Cl.³ H01L *21/263*; C25F *3/00*

U.S. Cl. 29—576 B **11 Claims**







1. A method of manufacturing a semiconductor device comprising the steps of selectively implanting proton ions into a principal surface of a P type monocrystalline silicon substrate;

heating said silicon substrate to form an N type monocrystalline silicon region;

anodizing said substrate to form a porous silicon region extending in a thickness direction from the major surface of said P type monocrystalline substrate except said N type silicon region, said porous silicon region being formed to contact with all side surfaces and at least a portion of a bottom surface of said N type silicon region; and

thermally oxidizing said porous silicon region for converting the same into a porous silicon oxide region while at the same time converting said N type silicon region into a P type silicon region.

4,393,578

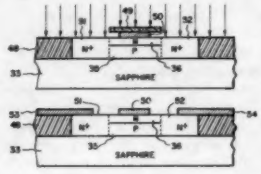
METHOD OF MAKING SILICON-ON-SAPPHIRE FET

William R. Cady, Scotia; SePuan Yu, and John R. Eshbach, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 109,174, Jan. 2, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,548

Int. Cl.³ H01L *21/225, 21/308*

U.S. Cl. 29—576 B **3 Claims**



1. The method of making a silicon-on-sapphire junction field effect transistor structure comprising the steps of:

forming on a sapphire substrate lower and upper opposite conductivity type silicon layers having given area dimensions, said lower layer being lightly doped and said upper layer moderately doped;

depositing on said upper silicon layer a layer of doped polycrystalline silicon and fabricating thereon a patterning layer;

etching said polycrystalline silicon to undercut beneath said patterning layer and define a gate conductor;

implanting impurity ions into exposed areas of said silicon layers using said patterning layer as a mask, and removing the latter;

annealing to activate said implanted impurity ions and result in heavily doped source and drain regions which are self-aligned with said gate conductor and have a channel region therebetween, said annealing further diffusing impurity atoms from said polycrystalline silicon gate conductor to create a gate region of opposite conductivity type as said channel region; and

depositing conductor metallizations on said source and drain regions.

4,393,579

DEVICE FOR MOUNTING CHIP-TYPE ELECTRONIC COMPONENTS ON A SUBSTRATE

Godwin J. O. G. Van Hooreweder, Brugge, Belgium, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1981, Ser. No. 235,802

Claims priority, application Netherlands, Feb. 25, 1980, 8001114

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—740 **4 Claims**

1. A device for mounting chip-type electronic components on a substrate, comprising a table, a mounting head fixed to the table, and means for positioning a substrate with respect to the mounting head, characterized in that the mounting head comprises:

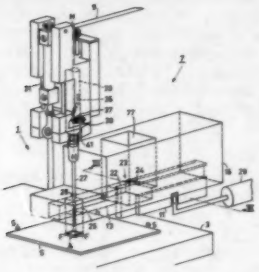
a guide fixed in position with respect to the table, defining a single horizontal channel said guide having a vertical passage therethrough,

a slide displaceably mounted in said guide for movement along said channel only between a loading position and an unloading position, and having a recess for accommodating and transporting a component, said recess having a horizontal supporting surface and a vertical abutment face for engaging a component being transported in the recess,

a suction device moveably mounted to be displaceable in a vertical direction only, through said passage, and

means for displacing said suction device upward to pick up a component from the slide when the slide is in the unload-

ing position; and then when the slide is moved from the unloading position, downward to move the component



through said passage to position the picked up component onto a substrate positioned underneath the guide.

4,393,580

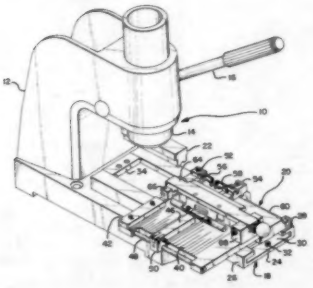
ONE STEP APPLICATOR TOOL

Leslie C. Hall, Jr., Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 5, 1981, Ser. No. 231,714

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—749 **5 Claims**



1. In an applicator tool for applying a connector having a plurality of insulating piercing electrical terminals onto a multi-conductor flat cable with each terminal engaging a respective conductor, said tool having a frame having integral spaced upper and lower arms, ram means mounted in said upper arm for vertical movement, an upper tooling member mounted on a free lower end of said ram means, means to actuate said ram means, guide rail means mounted on said lower arm extending from a point beneath said ram means in cantilever fashion, and a lower tooling assembly including a sliding base mounted on said guide rail means for sliding motion between a point remote from said ram to said point beneath said ram, a base plate assembly fixed to said sliding base and including a base plate, cable guide means mounted on the base plate, cable clamp means for securing a cable to said base plate, connector receiving means, and cable stop means selectively positionable to abut the free end of a cable and to allow through feed of said cable whereby a connector can be applied intermediate the ends of the cable, said cable clamp means comprising:

a first fixture secured to one edge of said base plate,

a locking fixture secured to the opposite edge of said base plate,

a clamping arm having one end pivotally attached to said first fixture and locking means on the opposite free end engageable with said locking fixture,

first cable engaging means supported on said clamping arm by first spring means so as to apply constant force to a cable, and

second cable engaging means supported on said clamping arm by second spring means so as to apply increased force to a cable upon locking of said clamping arm in said locking feature.

4,393,581

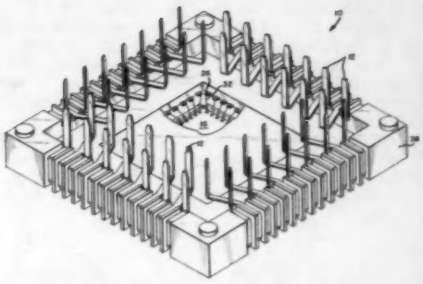
METHOD OF FORMING LEADS ON A LEAD FRAME

Gabriel B. Cherian, York, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 114,451, Jan. 22, 1980, abandoned. This application Oct. 5, 1981, Ser. No. 308,221

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—827 **3 Claims**



1. A method of forming a lead frame comprising the steps of:

a. stamping out a flat lead frame having a center pad and a plurality of leads extending outwardly from one or more sides thereof, every other lead consisting of an inner end adjacent the center pad, a long outer end and a midsection intermediate the inner and outer ends and the leads in between the every other lead consisting of an inner end adjacent the center pad, a short outer end and a midsection intermediate the inner and outer ends, further said outer ends of all leads being stamped out to extend obliquely away from the midsection,

b. forming one row of legs along a first side of the center pad by perpendicularly bending the short outer ends where the midsections and outer ends join; and

c. forming a second row of legs spaced from and parallel to the first row of legs by perpendicularly bending the long outer ends at a predetermined distance outwardly from where the midsection and outer ends join.

4,393,582

METHODS OF AND APPARATUS FOR FORMING A CABLE CORE HAVING AN INTERNAL CABLE SHIELD

William S. Arnold, Jr., and Joseph C. Tulloss, both of Baltimore, Md., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 6, 1980, Ser. No. 204,429

Int. Cl.³ H01B *13/20*; B23P *23/00*

U.S. Cl. 29—828 **7 Claims**

1. A method of assembling a plurality of units of insulated conductor pairs and a metallic strip into a cable core in which the units are separated into groups by the metallic strip, said method comprising the steps of:

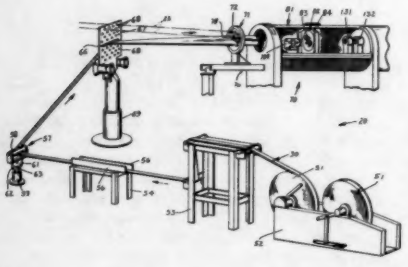
moving each of a plurality of units of a first group of units of insulated conductor pairs along a path of travel through an associated individual opening in a first faceplate, through an associated individual opening in a guide plate and then through an opening in a second faceplate which is common to all the units in said first group;

moving each of a plurality of a second group of units of

insulated conductor pairs along a path of travel through an associated individual opening in the first faceplate and then through an opening in the second faceplate which is common to all the units in said second group;

causing a metallic strip to be formed into a screen which has a generally central portion that is disposed between the groups of units and an arcuate portion that is attached to each end of the central portion with each arcuate portion enclosing at least a portion of an associated group of the units, said step of causing the metallic strip to be formed incuding the steps of moving the strip through a slotted opening in the first faceplate which is disposed between the groups of openings and moving the metallic strip through a slotted opening in the second faceplate which is disposed between the common openings, the slotted opening in the second faceplate having a central portion between the common openings and an arcuate portion that is attached to each end of the central portion; while

engaging at least a portion of the strip which is adjacent to the first group of units as the units of the first group are being moved through the openings in the guide plate between the two faceplates to cause one arcuate portion to be disposed in a predetermined manner about the units of the first group without inadvertent deformation of the strip, the steps of moving each of the units of said first group through an individual opening in the guide plate being effective to cause the units of said first group to be maintained in a predetermined position as the metallic strip is being formed about the units of the first and second groups.



3. Apparatus for forming a cable core having an internally disposed shield which separates groups of stranded conductor units that are in a predetermined arrangement, said apparatus comprising:

a first faceplate having a plurality of openings formed therethrough in two groups, each of said openings of one group being adapted to permit passage of a stranded cable unit of a first group of units and each of said openings of the other group being adapted to permit passage of a stranded cable unit of a second group of units, said first faceplate also including a slot which is disposed between the groups of openings and which is adapted to permit passage of a metallic strip therethrough;

a second faceplate spaced from said first faceplate, said second faceplate including a first opening for passing a first group of the units, a second opening for passing a second group of the units, and a slot having an arcuate portion depending from each end thereof;

means for advancing each of a plurality of stranded conductor units along a path of travel through an opening in the first and then through one of the openings in the second faceplate and for advancing a metallic strip along a path of travel which is interposed between the groups of the units and through said slots in said faceplates to cause said strip to be formed into a configuration having arcuate free end portions each of which encloses at least a portion of one of the groups of units; and

plate means interposed between said first and second faceplates and cooperating with said slot in said second faceplate for causing said strip to be formed into a screen of a predetermined configuration while preventing buckling of the strip as it is advanced between said faceplates and for controlling the formation of the arcuately disposed portion of the strip that is to enclose the first group of units, said plate means including an arcuately configured edge surface which engages the strip as it is advanced between said first and second faceplates and a plurality of openings in an arrangement which corresponds to that of the units in the first group of the cable units.

4,393,583

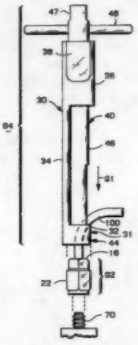
ANTI-TORQUE CONNECTION APPARATUS AND METHOD FOR USING

Henry J. Zwald, Mesa, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Mar. 17, 1981, Ser. No. 244,583

Int. Cl.³ H01R *43/00*; B25B *13/00*

U.S. Cl. 29—857 **2 Claims**



1. A method of tightening a cable connector which is inelastically coupled to a cable, the connector being adapted to couple the cable to a mating device, said method comprising the steps of:

providing the cable connector having at least a cable adaptor and a nut, said cable adaptor being adapted to be firmly engaged by a tool, said tool having an adaptor engagement portion with a slot said adaptor engagement portion being adapted to firmly engage said cable adaptor without interferring with said cable;

furnishing a nut driver having a nut engagement portion rotatably disposed around said adaptor engagement portion of said tool and having a cutaway cylindrical portion capable of being aligned with said slot in said tool;

engaging said nut with said nut engagement portion;

passing said cable through said slot in said adaptor engagement portion, and through said cutaway cylindrical portion;

restraining said cable adaptor from rotation about said cable with said tool; and

rotating said nut driver and thereby rotating said nut to tighten said cable connector to the mating device.

2. An apparatus for tightening a cable connector to a mating device, said cable connector having at least a cable adaptor and a nut, said cable adaptor being inelastically coupled to said cable, said cable adaptor being adapted to be firmly engaged by a tool, said apparatus comprising in combination:

a tool having a portion adapted for firmly engaging and for preventing rotation of the cable adaptor, said tool having a cylindrical portion with a slot for allowing clearance for the cable; and

a nut driver rotatably disposable around said tool for firmly tigtening the nut, said nut driver having an engagement portion shaped to allow said nut driver to firmly engage

and to turn the nut, said engagement portion being capable of coaxial rotation around said portion of said tool, said nut driver having a cut away cylinrical portion coaxially arranged around and capable of being aligned with said slot in said cylindrical portion of said tool to form an aperture larger than the cable, said aperture allowing said nut driver to be axially fed and rotated around said tool while providing clearance for the cable.

4,393,584

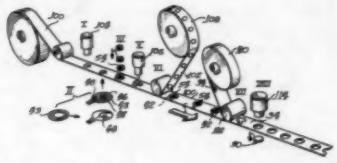
METHOD OF MANUFACTURE OF ELECTRODE CONSTRUCTION

Rex O. Bare, and Earl F. Robinson, both of Lawrence, Kans., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Division of Ser. No. 100,904, Dec. 6, 1979, Pat. No. 4,365,634. This application Oct. 9, 1981, Ser. No. 310,119

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—877 **6 Claims**



1. A method of fabricating a disposable medical electrode assembly including a cover, said method comprising the steps of: providing a strip including, a first layer of material having an adhesively coated surface, which layer will provide the support layer for the electrode assembly, and a second layer in the form of a first release liner covering and engaged with said adhesively coated surface; forming an opening in said strip extending through said first layer and said first release liner; mounting a terminal member and a porous matrix with respect to said opening; removing said first release liner to expose the adhesively coated side of said strip, while leaving said porous matrix and said terminal means in place; applying a second release liner to the exposed adhesively coated surface of said strip, which liner is aperture free and overlies and protects said matrix and said adhesively coated surface of the support layer, said second release liner thereby providing a cover for said electrode assembly; severing the completed electrode assembly from said strip.

4,393,585

DRY-SHAVING APPARATUS WITH HAIR-TRIMMING MEANS

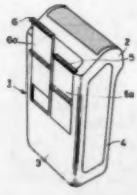
Petrus J. J. Nagelkerke, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 11, 1981, Ser. No. 262,235

Claims priority, application Netherlands, Jun. 25, 1980, 8003670

Int. Cl.³ B26B *19/20*

U.S. Cl. 30—34.1 **5 Claims**



1. A dry-shaving apparatus provided with hair-trimming means comprising a first pair of cooperating toothed cutters, one being reciprocatory and the other being stationary in operation, said first pair of cutters forming a first hair trimmer and being adjustable between different positions; and a second pair of cooperating toothed cutters, one being reciprocatory and the other being stationary in operation, said second pair of cutters being arranged for operation in line and in juxtaposition with the first pair of cutters in at least one of said positions thereof so as to form with the first pair of cutters a second hair trimmer of greater length than the first hair trimmer measured in the direction of reciprocation of the reciprocatory cutters, or said second pair of cutters having a greater length than the first pair of cutters measured in the direction of reciprocation of the reciprocatory cutter of each pair of cutters and being arranged to form independently of the first pair of cutters a second hair trimmer of greater length than the first hair trimmer.

4,393,586

SHAVING BLADE ASSEMBLY FOR ROTARY TYPE ELECTRIC SHAVER

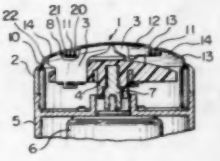
Tetsuo Hamashima, and Fumihiro Kumano, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jul. 29, 1980, Ser. No. 173,427

Claims priority, application Japan, Aug. 7, 1979, 54-108789[U]

Int. Cl.³ B26B *19/14*

U.S. Cl. 30—43.6 **3 Claims**



1. A shaving blade assembly for a rotary type electric shaver, comprising:

an outer blade including a dome-shaped flexible steel foil including inner and outer surfaces, and having a plurality of hair-introducing apertures provided in a substantially spherical central area thereof,

said outer blade being provided with a groove recessed longitudinally inwardly from said outer surface thereof and extending concentrically relative to a longitudinal axis of said outer blade which passes through said central area, said groove located radially inwardly of an outer periphery of said outer blade to separate said central area of said outer blade from an outer area thereof, said groove including radially inner and outer side walls and a base interconnecting said side walls, said radially inner side wall forming with said outer surface of said outer blade a first edge, said radially outer side wall forming with said outer surface a second edge, said first edge extending longitudinally outwardly to a greater extent than said second edge, a plurality of first hair-introducing slits extending from within said central area and along said radially inner side wall toward said base, and a plurality of second hair-introducing slits extending from within said outer area and along said radially outer side wall toward said base, and

an inner blade member beneath said outer blade and including:

a plurality of inner blades, each inner blade having a shearing edge corresponding to said inner surface of said outer blade and extending generally radially along a substantial portion thereof, including a substantial portion of said central area to support said outer blade, and

a substantially disk-shaped inner blade frame supporting

said inner blades in radial direction bringing said shearing edges into resilient and slidable contact with said inner surface of said outer blade and having an axial hole for receiving a rotary driving shaft of a motor of said shaver to rotate said inner blade member about a longitudinal axis of rotation,

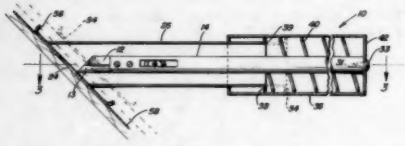
each of said inner blades having an incision in a position corresponding to said groove of said outer blade, and said incision having edge parts spaced from said inner and outer side walls of said groove to define therebetween a gap for allowing relatively long hair to be introduced into the gap through said first and second slits in said side walls.

4,393,587

SPRING SHIELDED SAFETY KNIFE

William A. Kloosterman, 6553 Hearne Rd. - 1107, Cincinnati, Ohio 45211

Filed Apr. 23, 1981, Ser. No. 256,775
Int. Cl.³ B26B *1/08*
U.S. Cl. 30—162 **6 Claims**



1. A spring shielded safety knife, said knife including handle means for permitting a user to operably grip said knife, said handle means having a hollow interior portion, blade cutting means fixedly secured to said handle means and extending outwardly therefrom, blade shield means normally positionable over said blade cutting means and being slidably retractable into said hollow interior portion of said handle means, spring means contained in said hollow interior portion biasing said blade shield means into blade shielding position, said blade shield means being retained in position over said blade cutting means by a compression force provided by said spring means, said blade cutting means being detachably securable to a longitudinally extending blade shaft, said blade shaft being in concentric alignment with said hollow interior portion of said handle means and being fixedly secured to a remote end of said handle means, said blade shaft having a travel slide means operably associated therewith, said travel slide means serving to regulate a depth of cut of said blade cutting means by limiting a movement of said blade shield means into said hollow interior portion of said handle means, said travel slide means including a travel slide operably positionable in a slot on said blade shaft and further including a screw means threadably securable thereto, said screw means passing through said slot means in said blade shaft and being securable to an aperture contained on said blade shield means.

4,393,588

FOOD MINCER

Eugene Kowalski, South Orange, N.J., assignor to Elpo Industries, Inc., Paramus, N.J.

Filed Mar. 9, 1981, Ser. No. 241,662
Int. Cl.³ A47J *19/04*
U.S. Cl. 30—196 **6 Claims**

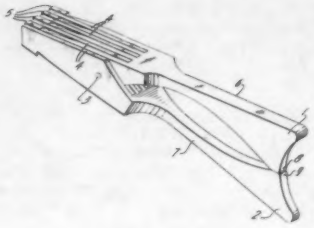
1. An implement for mincing comprising:

a pair of pivoted members each having a handle portion and a portion having a plurality of blade-like members with nonreentrant cutting edges;

the pivoted members being interchangeable;

the blade-like members on one pivoted member being adapted to interleave with a complementary set of blade-like members on a like portion of the other pivoted member;

each of the portions having the blade-like members being



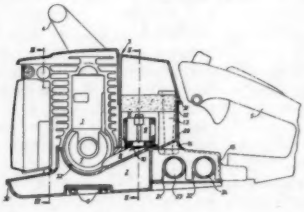
notched at their ends remote from the pivot for securely grasping and holding an article between the blade-like members to enable the blade-like members to shear through an article as the blade-like members are pivoted.

4,393,589

CONSTRUCTION FOR A MOTOR-DRIVEN CHAIN SAW

Bengt A. Barkhult, Hovas, Sweden, assignor to Emab Electrolux Motor Aktiebolag, Huskvarna, Sweden

Filed Jun. 5, 1981, Ser. No. 270,793
Claims priority, application Sweden, Jun. 9, 1980, 8004300
Int. Cl.³ B27B *17/00*
U.S. Cl. 30—381 **6 Claims**



1. A chain saw having an oil pump and a carburetor comprising: a plurality of units including an engine-saw unit, a casing, a fuel tank, a fuel filter for said fuel tank forming a filter-tank unit, said filter-tank unit including a top portion and a bottom portion restricting spacings for oil and fuel, respectively, and enclosing said filter, a plurality of pipes molded and permanently mounted in said top portion for oil and fuel from the respective tanks to said oil pump and carburetor, said carburetor which is located on said top portion and is provided with an air filter, and a permanently formed and molded holder in said top portion for holding said filter.

4,393,590

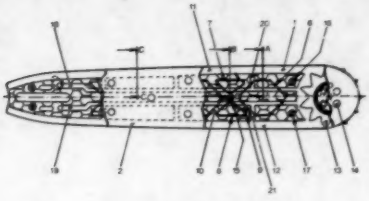
SAW GUIDE BAR

Glenn G. E. Pantzar, Arsunda, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Sep. 17, 1981, Ser. No. 303,041
Claims priority, application Sweden, Oct. 3, 1980, 8006930
Int. Cl.³ B27B *17/02*
U.S. Cl. 30—387 **12 Claims**

1. A chain saw guide bar comprising two side plates and an intermediate layer, each of said side plates comprising an outer layer of fiber-reinforced plastic material and an inner layer of

metal which is glued to said outer layer, said intermediate layer being of less height than said inner layers such that said inner



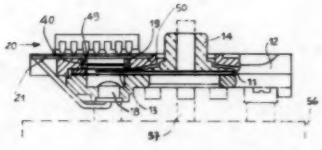
layers and said intermediate layers form a guide track for a saw chain.

4,393,591

OPTICAL TRANSDUCER

Renato Conta, Ivrea. Italy, assignor to Ing. C. Olivetti & C., S.p.A., Italy

Filed Nov. 13, 1981, Ser. No. 320,875
Claims priority, application Italy, Nov. 17, 1980, 68755 A/80
Int. Cl.³ G01B 11/00, 11/26
U.S. Cl. 33—1 L 6 Claims



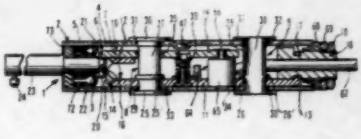
1. An optical transducer for determining the angular position of a rotatable member relative to a fixed structure, comprising a disc connected to said rotatable member and provided with a plurality of radial light transmitting elements alternate to light non-transmitting elements, a housing connected to said fixed structure and inside which said disc is lodged, a light emitting element mounted on said housing for illuminating said radial elements, a plurality of photocells arranged on said housing to detect the passage of light through said light transmitting elements, and an electronic circuit connected to said photocells for generating output signals indicative of the angular position of said rotatable disc with respect to said housing, wherein said circuit comprises active and passive components, electrical interconnections between said components, at least one trimming resistor for regulating said output signals within predetermined limits, a ceramic plate mounted on said housing and having an external flat surface on which said electrical interconnections and said trimming resistor are deposited, and an edge reference element deposited on said ceramic plate at a predetermined and exact distance from said trimming resistor, for causing the trimming of said trimming resistor to be operated by means of a calibrating apparatus including a laser beam automatically founding said edge reference element and automatically positionable on said trimming resistor starting from said edge reference element.

4,393,592

GAUGE FOR CHECKING LINEAR DIMENSIONS OF MECHANICAL PIECES

Carlo Dall'Aglio, Volta Reno di Argelato, Italy, assignor to Finike Italiana Marposs, S.p.A., S. Marino di Bentivoglio, Italy

Filed Jul. 16, 1981, Ser. No. 283,875
Claims priority, application Italy, Jul. 22, 1980, 2477 A/80
Int. Cl.³ G01B 5/02, 7/02
U.S. Cl. 33—172 B 9 Claims



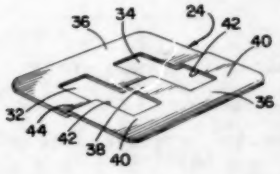
1. A gauge for the dimensional checking of mechanical pieces, including supporting means; a gauging arm; means for connecting the arm to the support means adapted to enable movement of the arm; a feeler, fixed to the movable arm to contact the surface of the piece to be checked; a spring including coils defining a geometrical axis, the spring having a first end cooperating with the gauging arm; and an adjustment device with a movable element cooperating with a second end of the spring, for adjusting the force applied by the spring to the gauging arm, wherein said adjustment device includes a control device, coupling means to couple the control device to the support means while allowing the rotation of the control device about said axis, the control device being coaxial with the spring and arranged substantially inside the coils of the spring, the adjustment device further including a member fixed to the support means and that cooperates with the movable element in order to prevent it from rotating while permitting its axial translation along said axis, the control device being coupled to the movable element to control said axial translation.

4,393,593

REGISTER-PIN-LOCATING DEVICE

Robert P. Abbott, 7241 Garden Grove Blvd., Ste. E, Garden Grove, Calif. 92640

Filed Sep. 28, 1981, Ser. No. 305,926
Int. Cl.³ B41B 1/00
U.S. Cl. 33—184.5 7 Claims



1. A register-pin-locating device, comprising:

a substantially flat rectangular plate having a longitudinal bend formed therein, defining first and second half sections

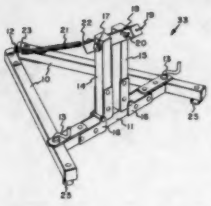
wherein said first and second half sections are horizontally offset from each other; and

at least one elongated slot formed in said plate transversely to said bend, said slot being equally disposed in each of said half sections.

4,393,594
COLLAPSIBLE SCRIBER ASSEMBLY

Ronald E. Hoffman, Uniontown, Ohio, and William K. Freed, Memphis, Tenn., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 6, 1982, Ser. No. 337,557
Int. Cl.³ G01B 5/255
U.S. Cl. 33—203.16 **5 Claims**



1. A collapsible scriber assembly for checking the radial and lateral runout of a wheel and tire assembly and for marking a reference line on a tire, comprising:

(a) a horizontal base assembly comprising at least two straight bar members, at least one of said straight bar members being hinged at the center of its length, and all of said straight bar members connected to each other at or near their ends by means for attaching and detaching;

(b) at least one straight vertical member, having first and second ends, the first end attached hingably to one of the straight bar members of said horizontal base assembly in such a manner that when it is in its operative position said straight vertical member is perpendicular to said horizontal base assembly and extends vertically upward therefrom;

(c) a pivot mechanism held in place perpendicular to said straight vertical member by means for attachment at or near the second end of said straight vertical member;

(d) a pivot bar, with first and second ends, having a bore through it near the center of its length, a well in the first end and an eyelet attached to the second end, said pivot mechanism passing through the bore in the pivot bar so that said pivot bar may pivot in a vertical plane;

(e) a scribe, used for providing a reference point and for making a reference line, inserted lengthwise in the well in the first end of said pivot bar and held in place by means for securing such as a set screw; and

(f) a coil spring, having first and second ends, the first end of said coil spring affixed to the eyelet at the second end of said pivot bar, and the second end of said coil spring affixed to said horizontal base assembly, providing a stabilizing tension on the pivot bar.

4,393,595
TUBE ADJUSTMENT GASKET AND RIFLE SCOPE EMPLOYING SAME

Dale E. Gibson, Salem, Oreg., assignor to Leupold & Stevens, Inc., Beaverton, Oreg.

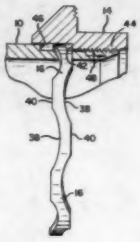
Filed Jul. 20, 1981, Ser. No. 284,966
Int. Cl.³ F41G 1/38
U.S. Cl. 33—245 **23 Claims**

1. An adjustment gasket of synthetic plastic material, comprising:

a resilient ring member;

a plurality of resilient locking means provided on the ring member at positions spaced about the longitudinal axis of said ring member, including a plurality of concave curved surface portions of substantially the same shape spaced about the periphery of said ring member; and

a plurality of flat surface portions spaced between said concave portions about the periphery of said ring member and positioned longitudinally outward of said arcuate portions so that a first set of alternating flat portions and arcuate portions are provided on at least one side of said ring

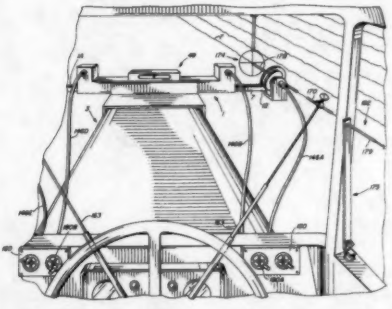


member substantially the same radial distance from the axis of the ring member to enable longitudinal compression of said resilient locking means.

4,393,596
REMOTELY ADJUSTABLE SIGHTING DEVICE FOR TRACTORS

B. Lynn Gerber, 6286 E. Catalina Dr., Scottsdale, Ariz. 85251

Continuation-in-part of Ser. No. 99,526, Dec. 3, 1979, Pat. No. 4,280,281. This application Nov. 6, 1980, Ser. No. 204,454
The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.
Int. Cl.³ G01C 15/00
U.S. Cl. 33—264 **14 Claims**



1. A sighting apparatus attachable to a tractor to enable a driver of the tractor to precisely align the tractor with swaths or furrows previously cut in a field by a farming implement towed to the tractor, said sighting apparatus comprising in combination:

a. a first extension arm for extending outwardly an adjustable distance to one side of the tractor from a mounting point of the tractor, said first extension arm having an outer end and an inner end;

b. support means pivotally connected to the mounting point and also engaging the inner end of said extension arm for supporting said first extension arm;

c. first adjustment means adjustable by a driver seated in the driver's seat of the tractor for controlling extending and retracting of said extension arm from said support means;

d. first sighting bar means rotatably connected to the outer end of said first extension arm for effecting visual alignment of the tractor with the previously cut swath or furrow;

e. second adjustment means adjustable by the driver when the driver is seated in the driver's seat of the tractor for controlling rotation of said first sighting bar means, said

first and second adjustment means being located sufficiently close to the driver's seat to be conveniently controlled by the driver while the driver assumes a normal driving position in the driver's seat;

f. pendulum means connected to said support means for maintaining said support means in a level orientation as the tractor tilts or is jolted as the tractor moves over uneven or rough ground; and

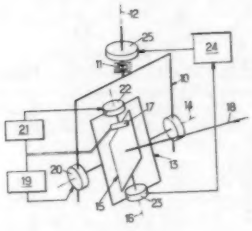
g. damping means engaging said pendulum means for damping movement of said pendulum means relative to the tractor.

4,393,597

STABILIZED SIGHTING DEVICES FOR VEHICLES

Jean-Francois Picard, Versailles, and Paul Jacquard, le Peco, both of France, assignors to Societe D'Applications Generales, Paris, France

Filed Dec. 29, 1980, Ser. No. 220,895
Claims priority, application France, Dec. 26, 1979, 79 31721
Int. Cl.³ G01C *15/14*
U.S. Cl. 33—275 G **7 Claims**



1. A stabilized sighting device comprising:

a first gimbal unit mounted for rotation about a first axis;

a drive motor for rotating said first gimbal unit about said first axis;

a second gimbal unit mounted for rotation on said first gimbal unit about a second axis perpendicular to said first axis;

a sight unit provided with a gyroscope and mounted on said second gimbal unit for rotation within a predetermined limited angular range with respect to a predetermined reference position which is a canonical position about a third axis perpendicular to said second axis;

first and second motor means for driving said second gimbal unit and sight unit about said second and third axes, respectively;

said gyroscope having a first sensitive axis located parallel to said second axis when the sight unit is in said predetermined reference position about said third axis, and a second sensitive axis parallel to said third axis,

first and second servo loop circuits connected to first and second outputs of said gyroscope for controlling said first and second motor means, respectively;

detector means arranged to deliver a signal representative of the deviation of said sight unit from the canonical position with respect to the second gimbal unit;

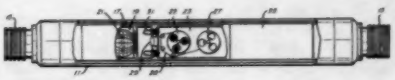
and a position copying loop controlled by said detector means and activating said drive motor in a direction tending to compensate said deviation, whereby said second servo loop returns said sight unit to said predetermined reference position which is a canonical position.

4,393,598

BOREHOLE TOOL

Steven W. Powell, and James G. Stockton, both of Houston, Tex., assignors to NL Sperry Sun, Inc., Sugar Land, Tex.

Continuation of Ser. No. 115,454, Jan. 25, 1980, abandoned. This application Apr. 19, 1982, Ser. No. 369,400
Int. Cl.³ E21B *47/00*
U.S. Cl. 33—302 **8 Claims**



1. An apparatus for measuring a borehole parameter comprising:

(a) an elongated housing having first and second ends;

means for supply alternating electrical power to said housing at either of said first or second ends, said means including at least one electrical conductor running between said first and second ends; (at either end to permit inversion of the housing in the borehole);

means within said housing for detecting a borehole parameter, said detecting means being activated in response to changes in the parameter being detected, said detecting means also being activated in response to the passage of an electrical current creating a magnetic field within the immediate environment of said detecting means;

means for dampening the response of said detecting means and thereby slowing down the response time of said detecting means to the magnetic field created by said electrical current; and

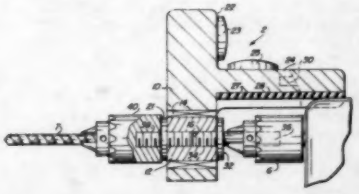
means for varying the direction of electrical current supplied to said housing at a rate faster than the response time of said detecting means when subjected to the electrical current, thereby providing a zero average magnetic field.

4,393,599

LEVELING MECHANISMS FOR HAND-HELD POWER DRILL

John W. Sterrenberg, 8350 E. McKellips Rd. #146, Scottsdale, Ariz. 85257, assignor to John W. Sterrenberg, Scottsdale, Ariz.

Filed Sep. 2, 1980, Ser. No. 183,183
Int. Cl.³ G01C *9/28*; B23B *49/00*
U.S. Cl. 33—336 **22 Claims**



1. A leveling mechanism for use in conjunction with a drill, the drill including a rotatable drive member for rotating a chuck, the rotatable drive member having a threaded central bore formed therein, said leveling mechanism comprising in combination:

(a) a support;

(b) a drive shaft rotatably mounted to said support and having an axis of rotation, said drive shaft having first and second ends, the first end of said drive shaft being coupled to said chuck, and the second end of said drive shaft being externally threaded and of a diameter commensurate with that of the threaded central bore within the rotatable drive member, said externally threaded second end of said drive

shaft being received directly by the threaded central bore within the rotatable drive member for rotating the chuck;

(c) said support being maintained at a substantially fixed point along the rotational axis of said drive shaft and at a substantially fixed distance from said drill and relatively proximate thereto for minimizing the distance between the drill and the chuck rotated thereby; and

(d) a first bubble level attached to said support to aid a user in holding the drill in a predetermined position.

4,393,600

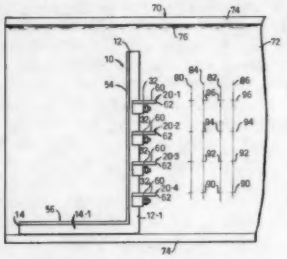
STRUCTURAL BEAM SQUARE

Norman O. Coe, 2600 Senter Rd. #77, San Jose, Calif. 95111

Filed Oct. 27, 1981, Ser. No. 315,538

Int. Cl.³ G01B *3/30*

U.S. Cl. 33—474 **4 Claims**



1. In a square for use in establishing a line on the base of a structure perpendicular to a wall extending from the base, the combination comprising,

unitary first and second arm members extending at right angles to each other, said first and second arm members having T-shaped cross sections, said first and second arm members comprising,

first and second coplanar stem members having inner and outer edges, and

first and second flanges extending along the inner edge of the respective first and second stem members, respectively, said first and second flanges being of uniform, equal, height, the outer free edge of one of said first and second arm members being adapted to abut the wall associated with the base with the other arm member extending perpendicular to the wall for use in marking off the base along said flange on the other arm member,

said square including at least one gauge member secured to the stem member of the other of said first and second arm members said gauge member including a gauge plate extending parallel to the one arm member abutting the wall of the structure for use in cross marking the line established using said flange on the other arm member, said gauge plate having a height equal to the height of said first and second flanges.

4,393,601

MEASURING DEVICE

Jerald G. Peterson, 1417 Kurtz Rd., McLean, Va. 22101

Filed Oct. 26, 1981, Ser. No. 314,865

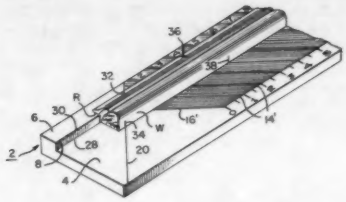
Int. Cl.³ G01B *3/02*

U.S. Cl. 33—494 **6 Claims**

1. A measuring device comprising a plurality of stepped surfaces including a first surface extending in a first longitudinal plane and a second surface extending in a second longitudinal plane, said first and second surfaces being substantially parallel and offset relative to each other to form said stepped surfaces,

a third surface extending from said first surface to said second surface in a third plane, said third surface extending substantially at right angles to said first and second surfaces,

a first reference mark positioned upon at least one of said surfaces at a position where the plane of said third surface intersects said first and second surfaces, and



at least one second reference mark comprising a plurality of marks which define at least one line which is spaced from said first reference mark and positioned upon at least one of said first and second surfaces at an angle of 135° relative to said third surface.

4,393,602

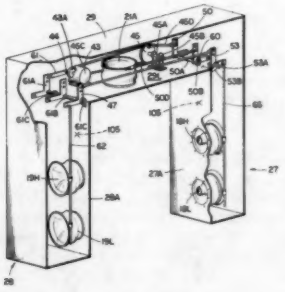
VEHICLE DRYING MACHINE AND METHOD

Judson L. Smith, 5432 Lighthouse La., Tempe, Ariz. 85283

Division of Ser. No. 932,273, Aug. 9, 1978, abandoned. This application Jul. 23, 1980, Ser. No. 171,338

Int. Cl.³ F26B *5/00*

U.S. Cl. 34—34 **2 Claims**



1. A method of drying a vehicle comprising the steps of:

establishing a path of relative linear horizontal movement between a nozzle and the vehicle,

directing a generally circular blast of air from the nozzle from one side of said path onto the exterior of the vehicle above the vehicle bottom at a velocity exceeding 150 mph,

directing second and third generally circular blasts of air against the exterior of the vehicle, said second blast being directed downward from above the vehicle and said third blast being directed generally horizontally and from the side of the path opposite said one side, and

oscillating the directions of said blasts in a direction of oscillation generally transverse to the direction of said path,

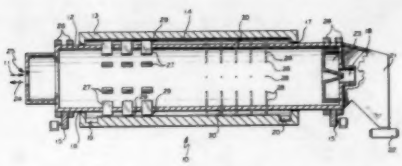
said blasts from the side being alternated in opposite directions so both are not blasting upward at same time.

4,393,603

DRYER THERMAL EFFICIENCY

John R. Casperson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 29, 1981, Ser. No. 278,159
Int. Cl.³ F26B 3/24
U.S. Cl. 34—39 15 Claims



1. A process for removing liquid from particulate matter which comprises:

(a) feeding said particulate matter containing the liquid into a rotary drum vessel which has attached thereto projections extending from the outside of the drum vessel through the drum vessel wall to the inside thereof, and having portions extending into the drum vessel and portions extending into the space outside of the drum vessel,

(b) contacting the outside of said vessel and those portions of said projections which extend into the space surrounding said vessel with a heating medium,

(c) rotating said rotary drum vessel containing said particalate material

(d) exposing the particulate matter containing liquid to those inside portions of said projections which extend from the interior of the vessel through the walls of the vessel to the exterior of the vessel and which contact the heating medium that contacts the vessel thereby transferring heat through said projections,

(e) vaporizing the liquid to be removed, and

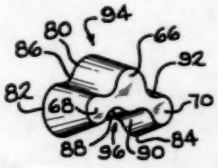
(f) recovering particulate matter having reduced liquid content.

4,393,604

OUTSOLE FOR ATHLETIC SHOE

Kevin J. Crowley, Newburyport, Mass., assignor to Converse Inc., Wilmington, Mass.

Filed Oct. 14, 1981, Ser. No. 311,485
Int. Cl.³ A43C 15/02
U.S. Cl. 36—67 R 1 Claim



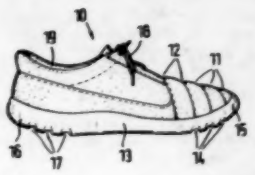
1. A cleat projection for an athletic shoe, having a shape characterized by three frustoconical members of equal height and unequal volume, two said members being smaller than a third said member, said third member being disposed between said smaller members, each of said three frustoconical members having a major axis, said major axes defining points on an arc, each said frustoconical member having a base portion, said base portions being overlapping portions, said shape including fillet portions interconnecting the sides of said frustoconical members.

4,393,605

SPORTS SHOE

Georg Spreng, Weiherstrasse 10, D-7272 Altensteig, Fed. Rep. of Germany

Filed May 18, 1981, Ser. No. 264,803
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043266
Int. Cl.³ A43B 5/00, 13/04, 23/00
U.S. Cl. 36—114 10 Claims



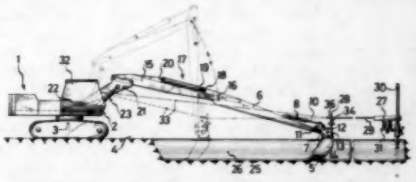
1. A sports shoe having a sole and an enclosing upper, said upper having a toe cap, formed of a plurality of strips, articulatingly interconnected along parallel lines extending from the inside edge toward the heel of said shoe at an acute angle with the longitudinal axis of said shoe, said sole being provided with a plurality of grooves aligned with the articulating interconnections of said strips.

4,393,606

EXCAVATOR WITH LASER POSITION INDICATOR

Waldemar Warnecke, Grasleben, Fed. Rep. of Germany, assignor to Friedrich Wilh. Schwing GmbH, Herne, Fed. Rep. of Germany

Filed Aug. 26, 1981, Ser. No. 296,450
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1980, 3032821
Int. Cl.³ E02F 5/02
U.S. Cl. 37—103 5 Claims



1. In a back hoe excavator of a type having an articulated digging device with a digging bucket mounted at an outer end, in which the digging bucket is capable of being set to a given cutting angle, and in which the digging bucket is moved toward a human operator of the excavator in a digging direction during a digging operation while the digging bucket is maintained at the given cutting angle, a position indicator apparatus for checking position of the digging device of the excavator relative to a digging floor which has already been formed, the position indicator apparatus being arranged in a field of view of the human operator of the excavator to provide a visual indication of the position of the digging device to the operator, the position indicator apparatus comprising:

laser transmitter means for providing a laser beam in a direction parallel to the digging direction, the laser transmitter means being positioned on an opposite side of the digging bucket from the operator, so that the digging bucket moves in the digging direction toward the operator and away from the laser transmitter means during a digging operation;

mounting means for mounting the laser transmitter means

with respect to the digging floor which has already been formed so that the laser beam is representative of vertical and horizontal aspects of a digging floor to be dug by the excavator; and

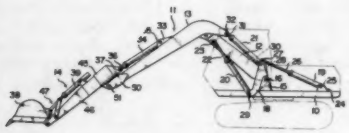
target means mounted to and carried by the digging device, the target means being at least partially transparent, and having a first surface facing the operator and a second, opposite surface for receiving the laser beam from the laser transmitter, and wherein the target means reproduces a visual image of an end point of the laser beam for parallax-free observation by the operator during an entire digging operation in which the digging bucket is set to a given cutting angle and moved in the digging direction toward the operator.

4,393,607

HYDRAULIC EXCAVATOR

Katsu Hirosawa, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 23, 1981, Ser. No. 314,516
Int. Cl.³ E02F 5/22
U.S. Cl. 37—103 **3 Claims**



1. A hydraulic excavator comprising:

a base;

a first boom mounted on said base for movement in a vertical plane about a first pivot;

a second boom mounted on said first boom for movement in the same vertical plane about a second pivot;

an arm assembly mounted on said second boom for movement in the same vertical plane about a third pivot;

an implement mounted at the swinging end of said arm assembly for movement about a fourth pivot;

means for swinging said first boom with respect to said base about the first pivot, said means including a lever pivotally mounted on said base and first and second hydraulic cylinders, said lever having first and second ends and is pivoted about the first pivot, said first hydraulic cylinder having its one end pivotally connected to said base and the other end pivotally connected to the first end of said lever while said second hydraulic cylinder has its one end pivotally connected to the second end of said lever and the other end pivotally connected to said first boom;

a third hydraulic cylinder for swinging said second boom with respect to said first boom about the second pivot;

a fourth hydraulic cylinder for swinging said arm assembly with respect to said second boom about the third pivot; and

a fifth hydraulic cylinder for swinging said implement with respect to said arm assembly about the fourth pivot.

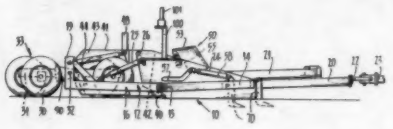
4,393,608

LAND FORMING AND EARTH MOVING EQUIPMENT

John R. Hodge, Nathalia-Katamatite Rd., Numurkah, Victoria, Australia (3636)

Filed Sep. 3, 1981, Ser. No. 299,170
Claims priority, application Australia, Sep. 2, 1980, PE5364/80
Int. Cl.³ E02F 5/00
U.S. Cl. 37—124 **17 Claims**

1. Earth moving and land forming equipment including an open frame formed as a forward section and a rearward section pivoted together on a transverse axis, the forward section adapted to be connected at its forward end to a tractor draw bar and the rear of the rearward section being supported at each side by land wheels, the wheels on each side being carried on an arm pivotally mounted on said rearward section, a fixed scraper blade at the pivoted end of the said rearward section, a load carrying container behind the scraper blade, an apron pivotally mounted above and forwardly of the load carrying container the forward section having substantially vertical wings on either side thereof to guide soil to the load carrying container, the apron having a substantially downwardly directed edge, when it is in a, first, raised position in which it is located substantially above the scraper blade so as to leave the



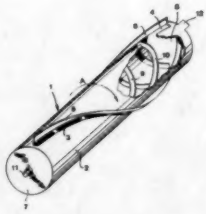
mouth of the load carrying container unimpeded, and means to cause the apron to rotate generally arcuately downwardly to a, second, lowered position in which the edge substantially abuts the scraper blade, the apron effectively closing the forward end of the load carrying container, the rotation being effected by hydraulic rams connected between the apron and formed slots in the wings, the slots constraining the ends of the rams to move in a fixed path to control the movement of the edge of the apron, means connected between the said forward and rearward sections, on each side of the frame pivot to effect raising and lowering movements of the said pivot and thus to the scraper blade.

4,393,609

FEEDING DEVICE

Arne Persson, Pl 5165, S-82027 Söderala, Sweden

PCT No. PCT/SE81/00102, § 371 Date Nov. 24, 1981, § 102(e) Date Nov. 24, 1981, PCT Pub. No. WO81/02723, PCT Pub. Date Oct. 1, 1981
PCT Filed Mar. 28, 1980, Ser. No. 328,571
Int. Cl.³ E01H 5/09
U.S. Cl. 37—238 **7 Claims**



1. A feeding device comprising a rotary drum in the casing wall of which one or more openings are provided to serve as intakes, with which blade-like elements cooperate, said blade elements projecting outwardly from the outside of the casing wall so as to rip and carry along goods and bring it into the interior of the drum through said intake upon rotation of the drum, means being provided inside the casing wall for conveying the goods introduced into the drum to an outlet opening at an end of the drum, said intake openings being in the form of narrow slots, which together with the associated blade elements extend helically along the casing wall, said means for conveying the goods to the outlet opening including a flange which projects from the inside of the casing wall towards the interior of the drum, said flange extending, like the slots and the blade elements, helically in the direction from one of the ends of the drum towards the other, the pitch of the slots and

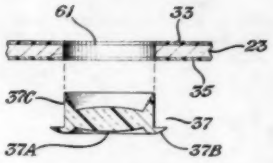
the blade elements along the drum being greater than the pitch of the interior flange.

4,393,610

CARD CARRYING MICROFILM AND ASSOCIATED READING LENS AND PROCESS OF FORMING SAME

David L. Adrian, Abilene, Tex., assignor to Lens-Card Systems, Inc., Abilene, Tex.

Filed Jan. 30, 1981, Ser. No. 229,972
Int. Cl.³ G09F *1/10*; G02B *27/04*
U.S. Cl. 40—625 **10 Claims**



1. A data card comprising:

a flexible paper stock having an information portion upon which information appears that can be read in the normal manner with the naked eye with a portion removed at one end region,

a microfilm upon which information is recorded and which is disposed at said one end region,

a pair of flexible clear plastic sheets laminating opposite sides of said paper stock respectively, including said microfilm,

an aperture formed through said clear plastic sheets and through said paper stock at an end region opposite said one end region,

a round plastic lens located in said aperture,

said lens having a central magnifying portion and an annular outer gripping portion for gripping the opposite sides of said card for securing said lens to said card and in said aperture,

said annular outer gripping portion extending transversely to the thin plane of said lens beyond said central magnifying portion on each side of said lens for providing protection for each side of said central magnifying portion,

said card being flexible whereby a reader may bend said card to align and focus the lens on the microfilm for reading the same.

4,393,611

PERPETUAL CALENDAR

Ronald S. Lane, 406 Deer Creek Dr., Plainsboro, N.J. 08536, and James M. Wittes, Linden, N.J., assignors to Ronald S. Lane, Plainsboro, N.J.

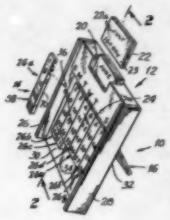
Continuation-in-part of Ser. No. 10,336, Feb. 8, 1979, Pat. No. 4,275,516, which is a continuation-in-part of Ser. No. 798,273, May 19, 1977, Pat. No. 4,142,311. This application Jun. 8, 1981, Ser. No. 271,613
Int. Cl.³ G09F *3/00*
U.S. Cl. 40—107 **10 Claims**

1. An improved permanent calendar assembly to precisely display any month of the year and reflect the number of days in the desired month, said assembly having a date column area, a plurality of date columns, and means to detachably secure said columns to said date column area, the improvement comprising:

at least one reversible mounting structure secured at the lower end of a respective one of said date columns for rotation about an axis extending along said column;

a pair of opposed surfaces on said mounting structure, a rear surface being unnumbered, the other surface defining a front surface having thereon a numberal representing the date of a day of the month; and

a lug on one of said mounting structure and said one date column extending toward the other of said mounting structure and said one date column; said other of said mounting structure and said one date column having openings on opposite sides of said axis extending thereinto



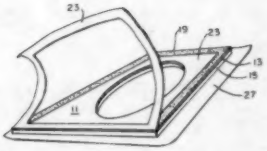
and through the rear thereof, each opening being dimensioned to receive said lug freely therein, but having a protrusion near the rear of said other of said mounting structure and said one date column positioned to interfere with the movement of said lug into said opening, whereby said mounting structure may be rotated to force said lug through the rear portion of one of said openings so that said lug is retained in said one opening.

4,393,612

PADDED FRAME

Susan Clark, 7270 Prow Way, Dublin, Calif. 94566

Filed Jun. 18, 1982, Ser. No. 389,854
Int. Cl.³ A47G *1/06*; G09F *1/12*
U.S. Cl. 40—152 **7 Claims**



1. A padded frame comprising

a mounting board having a uniform layer of foam sponge material secured thereto on one side thereof and having at least one opening for framing a picture or other object.

bands of adhesive surfaces disposed on the opposite side of said mounting board from said sponge layer and surrounding the periphery of said mounting board and the opening therein and

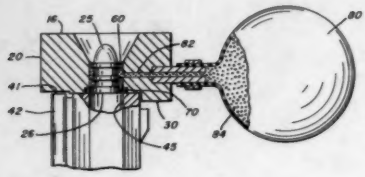
a decorative covering material stretched over said sponge material layer and squeezing it to the mounting board around the border of said mounting board and around the opening in the center thereof, said covering material being wrapped around the edges of said mounting board and the edge of said opening and stuck to said adhesive surfaces on the reverse side thereof.

4,393,613

PROJECTILE LUBRICATING AND MUZZLE LOADING DEVICE FOR GUN

Ronald J. Knosky, R.D. #3 - Box 166, Leechburg, Pa. 15656

Filed Sep. 15, 1980, Ser. No. 187,418
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—90 **7 Claims**



1. A projectile lubricating and muzzle loading device for muzzle loading guns comprising a body structure having:
(a) a top surface;
(b) a bottom surface for placing on the muzzle of the gun when inserting a projectile thereinto;
(c) an aperture adapted to receive and hold said projectile during lubrication and to align said projectile with the muzzle of the gun for purposes of loading, said aperture defined by a side wall structure extending from and connecting the top surface to the bottom surface, and having the axis thereof aligned substantially at right angles with the bottom surface;
(d) a resiliant member located in said aperture which cooperates with the projectile when placed in said aperture, said member adapted to restrict the flow of lubricant towards the rear of the projectile thereby preventing contamination of the powder with the lubricant when the projectile is loaded into said muzzle for firing; and
(e) means for introducing lubricant to said aperture when the projectile is held therein.

4,393,614

GUN REST

Fred E. Pickett, 508 Sophia La., Shreveport, La. 71115

Continuation-in-part of Ser. No. 158,060, Jun. 9, 1980, Pat. No. 4,345,398. This application Feb. 27, 1981, Ser. No. 238,763
Int. Cl.³ F41C *29/00*
U.S. Cl. 42—94 **8 Claims**

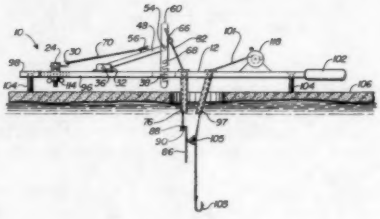
1. A gun rest for supporting a firearm comprising:
(a) a monopod characterized by a round, hollow and elongated base support member having a pivoted end and an open end opposite said pivoted end, and tapered from a top base support diameter at said pivoted end to a smaller bottom base support diameter at said open end, and a plurality of round, hollow and elongated interior support members carried by said base member and tapered from a first interior support diameter at the top ends thereof, respectively, to a smaller second interior support diameter at the bottom ends, thereof, respectively, to permit said interior support members to successively rest in, and selectively telescope from said open end of said base support member; and
(b) a monopod bracket pivotally attached to said pivoted end of said monopod and further comprising clamp means carried by said bracket for removable engagement with the barrel of said firearm to secure said monopod bracket and said monopod to said firearm.

4,393,615

FISHING APPARATUS

Vincent B. Hodshire, 2701 NE. Adams St., Peoria, Ill. 61603

Filed Nov. 30, 1981, Ser. No. 325,726
Int. Cl.³ A01K *97/01*
U.S. Cl. 43—15 **9 Claims**



1. A fishing apparatus comprising:
a main support member;
a first member connected to said main support and movable between first and second positions;
a trigger member connected to said first member;
means for retaining said trigger and said first member in said first position;
means for resiliently urging said trigger and said first member toward said second position;
a first elongated guide member extending from said main support, said first guide having a first end adjacent said trigger;
a first line connected to said trigger and extending through said first guide and terminating adjacent a second end of said guide;
a reel mounted on said main support;
a second elongated guide member extending from said main support, said second guide having a first end adjacent said reel;
a second line extendably connected to said reel and extending through said second guide; and
means connected to said first line for releasably engaging said second line.

4,393,616

TRAP APPARATUS, AND METHODS OF FABRICATING AND UTILIZING SAME

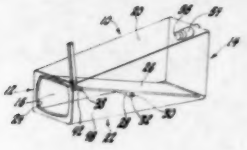
Gilbert T. Kaufman, Flint, and Alfred Evans, Swartz Creek, both of Mich., assignors to Critter Getter, Inc., Flint, Mich.

Filed Mar. 23, 1981, Ser. No. 246,882
Int. Cl.³ A01M *23/18*
U.S. Cl. 43—60 **16 Claims**

1. An animal trap comprising:
a housing forming an elongated chamber and having forward and rear walls;
an opening in said forward wall for entry of an animal to be trapped;
a platform member within said chamber and extending substantially the full length and width of said chamber, but being spaced from the walls of said cahmber sufficiently to

permit pivoting therein about a horizontal axis from a first condition in which said platform slopes upwardly from said opening to a second condition in which said platform slopes downwardly with respect to said opening;

means pivotally mounting said platform member within said chamber at a point spaced along said platform, whereby said platform can pivot about a horizontal axis;



an indicator mounted on said platform and moveable thereby to indicate the condition of said platform with respect to said opening and to thus give an indication that an animal may be trapped in said trap;

a locking device attached to said platform and operable to lock said platform in said second condition; and

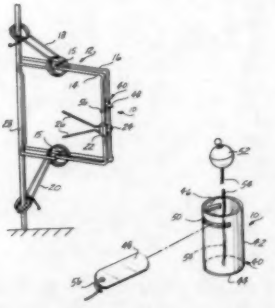
said indicator operably cooperating with said locking device and being movable by a user of said trap to unlock said locking device in said second condition.

4,393,617

ANIMAL TRAP SIGNAL APPARATUS

Nicky L. Charnoske, 1450 Sheldon St., Alger, Mich. 48601

Filed Jun. 5, 1981, Ser. No. 270,603
Int. Cl.³ A01M *23/26*
U.S. Cl. 43—96 **5 Claims**



1. A signal apparatus for use with an animal trap positionable underwater and having at least one movable portion comprising:

a housing having an open end, the housing adapted to be attached to the animal trap in a substantially vertical orientation with the open end uppermost;

a movable cover member for releasably closing the open end of the housing;

a buoyant float disposable within the housing;

means for extensibly attaching the buoyant float to the housing such that the buoyant float can rise to the surface of the water when released from the housing; and

means for connecting the cover member to a movable portion of the animal trap such that the cover member is movable to a position uncovering the open end of the housing and releasing the buoyant float therefrom in response to the closing of the animal trap.

4,393,618

NOVELTY WRITTEN MESSAGE DEVICE SUITABLE FOR MAILING

Otis E. Ray, P.O. Box 40302, St. Petersburg, Fla. 33743

Filed May 19, 1981, Ser. No. 265,204
Int. Cl.³ A63H *1/30*
U.S. Cl. 46—35 **2 Claims**

1. A written message carrier and spinning toy combination device comprising a pair of equal diameter equal thickness thin flat discs formed of stiff sheet material of a type which will accept writing by a pen or pencil at least on one face of each disc, a thin comparatively small diameter spacer ring between said discs coaxially and being adhesively fixed to the opposing interior faces of the discs and uniting them in parallel coaxially spaced relationship with the discs spaced apart a small distance not substantially greater than the thickness of the sheet material from which the discs are formed, said spacer ring forming an axle for the device, and a tether attached to the spacer ring and adapted to be wound thereon substantially in convolutions which overlap one another in a common plane radially of the discs, the thickness of the tether being such that the wound tether convolutions substantially fill the narrow space between said discs in the region occupied by the convolutions.

4,393,619

DOLL EYE HAVING INSERT FORMING THE IRIS

Mason D. Murch, 5419 Williams, Wayne, Mich. 48184

Filed Jun. 29, 1981, Ser. No. 278,733
Int. Cl.³ A63H *3/38*
U.S. Cl. 46—165 **6 Claims**

1. A doll eye comprising:

a substantially spherical solid body constructed of a thermosetting clay, said body having a substantially cylindrical and diametric bore formed through it,

an eye insert having an elongated stem and an annular flared-out portion at one end of the stem,

means for securing said eye insert to said body so that said stem protrudes into said bore and so that the outwardly facing side of said flared-out portion substantially conforms to the outer periphery of the body,

wherein said eye insert is constructed of a transparent material having a coating of colored material on the other side of said eye insert flared-out portion, said coating of col-

ored material determining the extent and color of the iris in the finished eye, and

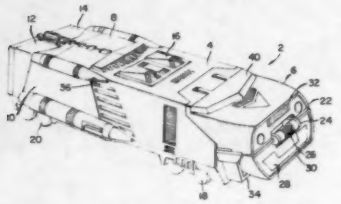
a coating of transparent material on the outer periphery of said body and said outwardly facing side of said flared-out portion.

4,393,620

ROCKET TRAIN TOY ASSEMBLY

Kazuya Murakami, Tokyo, Japan, assignor to Takara Co., Ltd., Osaka, Japan

Filed Jul. 31, 1981, Ser. No. 288,948
Int. Cl.³ A63H *11/10*
U.S. Cl. 46—201 **12 Claims**



1. A reconfigurable toy comprising:

a first housing member having a longitudinal axis configured to simulate a portion of a surface vehicle in an initial position;

a second housing member configured to simulate the front portion of a surface vehicle and relatively movable along the longitudinal axis from the first housing member, a portion of the second housing member is pivotally movable to reconfigure the front portion of the surface vehicle configuration into the nose portion of an aeronautical vehicle when placed in a second position;

first and second outer wall members are pivotally mounted to the first housing member and are simulated to complement a surface vehicle configuration in an initial position and to extend away from the first housing member to a second position to provide a set of wings for an aeronautical vehicle configuration;

means for biasing the outer wall members and the portion of the second housing member to an aeronautical vehicle configuration when placed into an initial position of a surface vehicle, and

means for activating the reconfiguration by releasing the outer wall members and portion of the second housing member to be moved by the biasing means.

4,393,621

TREE HOLDER

Clifford H. Rodell, 8749 Contee Rd., Laurel, Md. 20811

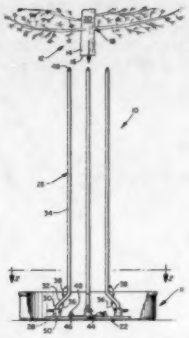
Filed Oct. 28, 1981, Ser. No. 315,712
Int. Cl.³ A47G *7/02*
U.S. Cl. 47—40.5 **15 Claims**

1. A stand for holding trees in an upright position comprising:

(a) a base upon which the end of a trunk of a tree rests when the tree is being held in an upright position;

(b) at least three orthogonally projecting members attached to a surface of the base at spaced apart locations which define a polygon, each member projecting a distance from the base such that it extends along the trunk to the stem where the branches join to the stem when the end of the trunk touches the base; and

(c) means attached to and extending upwardly from the base for holding the end of the trunk at least partially within the area of the polygon defined by the points of attachment to the members of the base, the means having a



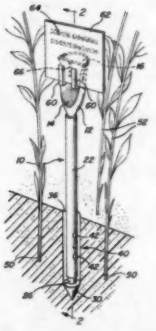
pointed member located on a line extending between each adjacent pair of vertices of the polygon.

4,393,622

WATER FUNNEL AND CARD HOLDER FOR CUT FLOWERS

Joseph S. Gallo, Sr., Walpole, Mass., assignor to Dakota Plastics Company, Watertown, S. Dak.

Filed Nov. 25, 1981, Ser. No. 324,864
Int. Cl.³ A01G *29/00*
U.S. Cl. 47—48.5 **6 Claims**



1. A water funnel arrangement for cut flowers including a unitary structure for funnelling water into a container having foam plastic material for receiving cut ends of cut flowers, the arrangement comprising:

a funnel having its large opening for receiving water and its small opening for passing water therefrom,

a tubular member having an opening at its upper end to receive the small opening of the funnel and for passing water through the tubular member to its lower end, said tubular member having at least one aperture proximate the lower end for discharging water therefrom and

a pointed tip means closing the lower end of the tubular member below the aperture and having a pointed portion insertable into the foam plastic, said pointed portion having a maximum dimension greater than the external dimension of the tubular member to provide a cavity in the foam plastic above the pointed portion to receive water discharged from the aperture and enabling water to contact the foam plastic throughout the height of the cavity and along the top surface of the foam plastic, said

funnel including a pair of slits formed therein extending downwardly from the upper edge thereof for holding a card having indicia.

4,393,623

ARRANGEMENT FOR MOUNTING A DOOR

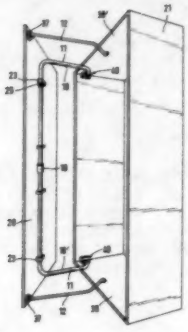
Johann Munz, Hinwil, Switzerland, assignor to Team Form AG, Hinwil, Switzerland

Filed Dec. 5, 1980, Ser. No. 213,544

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1979, 2950857

Int. Cl.³ E05D *15/32*

U.S. Cl. 49—248 19 Claims



1. An arrangement for mounting a door pivotable about a vertical axis and guided for parallel displacement relative to a housing, the arrangement comprising at least one guiding element arranged to guide a door for parallel displacement relative to a housing and pivotally connected with the former and the latter in predetermined pivot points; and a supporting element arranged to support the door on the housing and pivotally connected with the latter in further pivot points which are offset relative to the first mentioned pivot points, said supporting element including two separate shaped members which are mirror-inverted relative to one another and each has a horizontally extending leg and a vertically extending leg extending in different planes and an intermediate web connecting said legs with one another, said vertically extending legs can be cut into desired lengths and upon adjustment of the relative position of said horizontal legs in different vertical planes, being fixedly connected with one another for joint rotation.

4,393,624

THREAD GRINDER

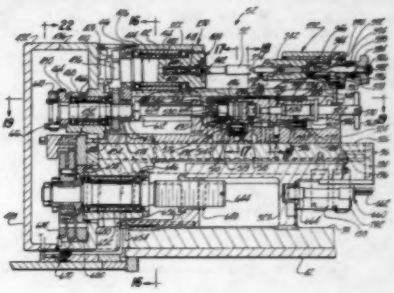
Anthony Kushigian, P.O. Box 768, Hendersonville, N.C. 28739

Filed Jan. 5, 1981, Ser. No. 222,501

Int. Cl.³ B24B *3/22*

U.S. Cl. 51—5 D 29 Claims

1. A machine for grinding workpieces comprising a base, a wheelhead carried by said base for reciprocation in a straight line path and constructed and arranged to drive a grinding wheel with its axis of rotation extending essentially transversely to said straight line path of reciprocation, a workhead adapted to releasably receive and rotate a workpiece and constructed and arranged to position the workpiece so that the point of contact between such workpiece and the grinding wheel is on one side of the centerline which intersects the axis of rotation of the wheel and extends parallel to such straight line path of reciprocation of said wheelhead, a grinding wheel dresser adapted to receive a dresser wheel and constructed and arranged so that the point of contact between the dresser wheel and the grinding wheel is located on the same side of the grinding wheel as the point of contact between the grinding wheel and the workpiece, on the other side of such centerline intersecting the axis of rotation of the grinding wheel and extending parallel to such straight line path of reciprocation of the wheelhead, and symmetrical about said centerline with the point of contact between the grinding wheel and the workpiece, an arm carried by said base, a pivot constructed and arranged to pivot said arm with respect to said base about an axis spaced from and extending generally parallel to the axis of rotation of said wheel and spaced from said straight line path of reciprocation of said grinding wheel, a dresser wheel drive carried by said arm at a point distal from such pivot and constructed and arranged to receive and rotate a dresser wheel with its axis of rotation extending essentially parallel to the axis of rotation of the grinding wheel, and said arm being constructed and arranged such that the location of its pivot point and the lineal distance between its pivot point and the axis of rotation of the dresser wheel is such that when said arm is pivoted so that the dresser wheel contacts the grinding wheel, the point of contact between the dresser wheel and grinding wheel is essentially symmetrical with the point of contact between the grinding wheel and the workpiece throughout the range of diameters of workpieces which can be ground by the grinding machine.



4,393,625

APPARATUS FOR GRINDING GEARS

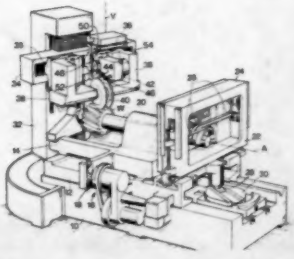
Peter Bloch, Mutschellen, and Hansjörg Bickel, Au, both of Switzerland, assignors to Maag Gear-Wheel & Machine Company Limited, Zurich, Switzerland

Filed Jun. 9, 1980, Ser. No. 157,977

Claims priority, application Switzerland, Jun. 20, 1979, 5757/79

Int. Cl.³ B24B *49/00, 53/06*

U.S. Cl. 51—165.87 2 Claims



1. An apparatus for grinding gear teeth having substantially involute-shaped tooth flank profiles and tooth roots, comprising:

at least one grinding head;

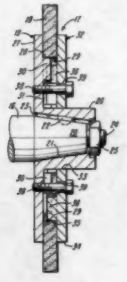
a substantially dished grinding wheel having an active grinding point and being mounted at said grinding head;
a grinding head support at which there is adjustably mounted the grinding head in the radial direction of the dished grinding wheel;
a dressing device displaceable in a predetermined adjustment direction;
means for displaceably grinding the dressing device at the grinding head in the adjustment direction;
adjustment device means;
said adjustment drive means including adjustment gearing, a pinion mounted at said grinding head, two gear racks extending in the adjustment direction and with which meshes said pinion, one of said gear racks being arranged at said grinding head support, the other of said gear racks being arranged at said dressing device;
said adjustment drive means imparting by means of the adjustment gearing to the grinding head and the dressing device adjustment movements in a ratio of approximately 1:2;
an advance drive means for displacing both gear racks in its lengthwise direction such that the pinion is prevented from rotating during a movement of the grinding head which is caused by the adjustment drive means, in order to thereby enable the dressing device to participate in the movement of the grinding head in a ratio of approximately 1:1;
said advance drive means shifts the active grinding point of the dished grinding wheel downwardly towards the tooth root of the gear tooth being ground so as to selectively grind a different part of the gear tooth by means of a peripheral portion of the dished grinding wheel;
said advance drive means shifts the active grinding point of the dished grinding wheel downwwardly towards the tooth root of the gear tooth being ground in order to grind said different part of the gear tooth along a grinding curve which differs from the involute along which there is ground the tooth flank profiles of the gear teeth.

4,393,626

TOOLHOLDER FOR SUPPORTING THIN ROTARY TOOLS

George A. Schroer, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 9, 1981, Ser. No. 319,577
Int. Cl.[3] B24B *41/04*
U.S. Cl. 51—168 1 Claim



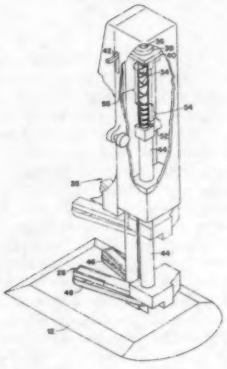
1. A toolholder for supporting thin rotary tools, comprising:
(a) a first tool ring having
(1) a generally circular tool support section,
(2) a flanged shoulder portion adjacent to said support section,
(3) facial tooth means and tooth space means formed in said support section,
(4) means for locating and driving said ring with a rotatable tool spindle;
(b) a second tool ring having
(1) a generally circular tool support section,
(2) a flanged shoulder portion adjacent to said support section,
(3) facial tool means and tooth space means formed in said support section;
(c) means for supporting said first and second rings in a concentric manner with each other and with the tooth means of one ring aligned with and disposed facing the tooth space means of the other ring; and
(d) means for clamping said rings together enmeshing respective tool support sections of said rings
whereby a tool having a thickness equal to or less than the combined lengths of each of said tool support sections of said rings may be clamped and supported on a substantially continuous bore support surface.

4,393,627

REVERSING SCREW/HIGH-LOW SPEED LEVEL WIND SCREW

Harrison A. Ailey, Jr., Knoxville, Tenn., assignor to Acraloc Corporation, Oak Ridge, Tenn.

Filed Feb. 23, 1981, Ser. No. 236,791
Int. Cl.[3] B24B *19/00, 3/00*
U.S. Cl. 51—246 9 Claims

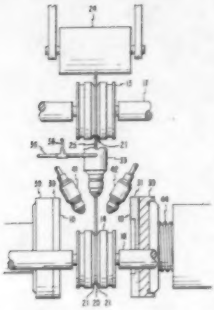


1. Sharpening mechanism for moving at a variable speed along the length of the edge of a recipicating knife of a cutting mechanism comprising:
driving means;
grinding means driven by said driving means for contacting an edge on said knife to be sharpened;
a movable carriage for supporting and moving said grinding means along said edge of said recipicating knife;
traversing mechanism for moving said movable carriage, said traversing mechanism including a drive shaft rotated by said driving means and having a first and further portion and right hand and left hand peripheral threads cut therein, a guide means for following said peripheral threads cut in said drive shaft, and a carrier member connecting said guide means and said movable carriage, said right and left hand peripheral threads having a first selected pitch along said first section of said drive shaft and a pitch different from said first selected pitch along said second portion of said drive shaft such that said driven grinding means is moved along selected portions of said recipicating knife edge at selected speeds.

4,393,628
FIXED ABRASIVE POLISHING METHOD AND APPARATUS

John C. Ottman, San Jose, Calif., and John C. S. Shen, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 4, 1981, Ser. No. 260,549
Int. Cl.³ B24B *1/00*
U.S. Cl. 51—281 SF 11 Claims



1. The method of polishing a rigid, metal magnetic disk substrate comprising:

applying a water soluble, low viscosity liquid vehicle to the disk substrate surface to be polished;

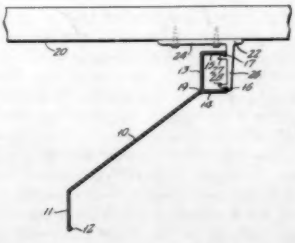
rotating an annulus of non-friable, non-rigid, high density polyurethane foam impregnated with in excess of 50% by weight of classified hard particles, said annulus being mounted on a rigid backing plate and having an inner diameter greater than the difference of the inner and outer radii of the disk substrate annular surface to be polished; and

positioning said annulus of impregnated foam in contact with said disk substrate with the axis of rotation parallel to the axis of rotation of said disk substrate and relatively displaced therefrom to cause the inner diameter of said impregnated foam annulus to extend across the disk substrate annular width to be polished, the contact pressure being at least 10 pounds per square inch.

4,393,629
EXTRUDED SNAP-FASTENING FOR SLATS AND METAL AWNING MADE THEREWITH

Aldo Gasparini, Kungsportsavenyn 34, and Nils E. Wimnell, Karl Gustavsgatan 59, both of 411 36 Goeteborg, Sweden, assignors to Aldo Gasparini and Nils Erik Wimnell

Filed May 5, 1981, Ser. No. 260,685
Int. Cl.³ E04B *1/34*
U.S. Cl. 52—74 11 Claims

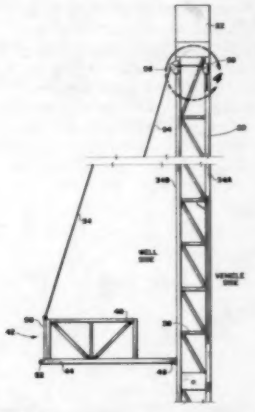


1. A metal awning structure having at least one awning slat, directly held in position at spaced locations along the same lateral boundary of said slat, on at least two brackets, said brackets each having a base portion and two parallel ridges outstanding therefrom in the same direction in channel configuration, said ridges being oppositely barbed and providing a substantially rectangular notch groove between each barb and said base portion, said awning slat being bifurcated along one edge into a channel-shaped web obliquely joined to the remainder of the slat at one channel corner of said channel-shaped web, the free edges of said channel-shaped web being oppositely beaded and being spaced apart so as to fit onto said brackets by snap action, said beads being of substantially rectangular profile and fitting into said notches for support of said slat on said brackets.

4,393,630
ACTUATION MEANS FOR THE RACKING PLATFORM OF A MAST

Arnold W. Knox, deceased, late of Tulsa, Okla. (by Ester Knox, executrix), assignor to Crane Carrier Corporation, Tulsa, Okla.

Filed Mar. 12, 1981, Ser. No. 243,049
Int. Cl.³ B66C *23/04, 23/62*
U.S. Cl. 52—121 16 Claims



1. In combination with a telescoping mast having a fixed lower structure and a traveling upper structure, actuation means for timed extension and retraction of a platform attached to said upper structure comprising;

at least one upper pulley secured within said upper structure above said platform;

at least one lower pulley secured within said upper structure below said platform;

traveling means cooperable with said upper structure and said lower structure;

catch means on said lower structure for receiving and retaining said lower traveling means; and

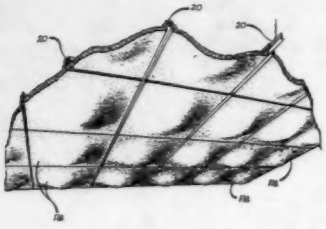
cable means extending from said platform around said upper pulley, said lower pulley and connected to said traveling means, whereby when said upper structure is extended said traveling means is propelled along said lower structure until received by said catch means whereupon said platform is extended.

4,393,631

THREE-DIMENSIONAL ACOUSTIC CEILING TILE SYSTEM FOR DISPERSING LONG WAVE SOUND

Edward D. Krent, 207 W. Eisenhower Dr., Sharon, Mass. 02067

Filed Dec. 3, 1980, Ser. No. 212,599
Int. Cl.³ E04B *1/82*
U.S. Cl. 52—144 **25 Claims**



1. An acoustic tile ceiling system comprising:

a suspended ceiling structural grid adapted to hold a plurality of individual acoustic tile elements;

a pluraliity of smoothly contoured acoustic tile elements, each tile element having a surface thereof adapted to form a ceiling surface when installed within said ceiling structural grid;

said tile element surface exhibiting a curvature substantially as a surface of revolution varying smoothly and without abrupt changes from a substantially horizontal aspect at the periphery of said tile element through an increasingly downwardly projecting curvature to an inflection point through a decreasingly downwardly projecting curvature to a central, substantially horizontal portion, depressed at least 5 centimeters below the peripheral portion;

each said tile element forming in the composite with adjacent tile elements as installed in said structural grid, a substantially continous smoothly flowing curvature, particularly adapted to disperse long wave length audible sound.

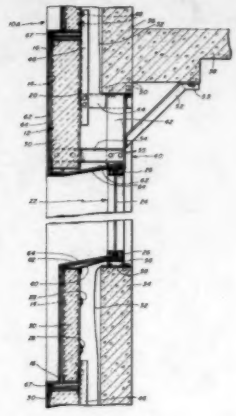
4,393,632

BUILDING SYSTEM

Clarence N. Levesque, Westford, Mass., assignor to C. Levesque Co. Inc., Lowell, Mass.

Filed Jan. 26, 1981, Ser. No. 228,336
Int. Cl.³ E04H *1/00*; E04B *2/88*
U.S. Cl. 52—235 **15 Claims**

1. A building panel system for covering the exterior surface of a building that is being restored having a plurality of structural panels with each panel adapted for support from an existing window opening and comprising; a rigid frame having a window opening, a window secured in the frame window opening, and means for securing the panel to the building including brace means extending from the rigid frame above the frame window opening to the building at the existing window opening, said existing window opening being defined at least in part by upper and lower vertical support walls, wherein the existing window opening is greater in height than the frame window opening with the existing window opening being covered by the window and a section of the frame overlying the window, wherein the brace means comprises a brace extending from the section of the frame overlying the window to the upper vertical support wall of the building, wherein the means for securing also includes a securing member coupled to



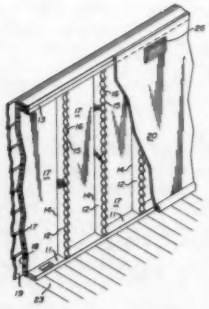
the rigid frame and secured to the top of the lower vertical support wall that in part defines the existing window opening.

4,393,633

WALL CONSTRUCTION

Joseph Charniga, P.O. Box 292, New Middletown, Ohio 44442

Filed Jan. 26, 1981, Ser. No. 228,480
Int. Cl.³ E04B *2/02*; E04C *2/80*
U.S. Cl. 52—303 **4 Claims**



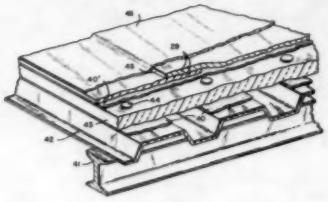
1. An improvement in an exterior load bearing wall construction having horizontally spaced vertically standing studding and outer and inner wall portions supported thereon, said improvement comprising the formation of said outer wall portion consisting of at least two layers of insulating board and at least one layer of insulating batting and an exterior surfacing material, a plurality of closely spaced scallops formed in the inner surfaces of said studding to form narrow transverse areas therebetween, said inner wall portion comprising dry wall and the like positioned against said narrow transverse portions of said studding, upper and lower plates positioned on the upper and lower ends of said studding, said outer wall portion extending only partially into areas of said wall construction between said studding so as to provide air spaces between said outer wall portion and said inner wall portion and openings in said inner wall portion for ventilating said air spaces.

4,393,634

ROOFING SYSTEM AND NEEDLE PUNCHED IMPREGNATED SYNTHETIC FIBER FABRIC

Thomas R. McDermott, Franklin, Mass., and Robert K. Jackson, Spofford, N.H., assignors to Clark-Cutler-McDermott Company, Franklin, Mass.

Filed Jun. 30, 1980, Ser. No. 164,806
Int. Cl.³ B32B 5/24, 11/10; E04C 1/00
U.S. Cl. 52—309.1 18 Claims



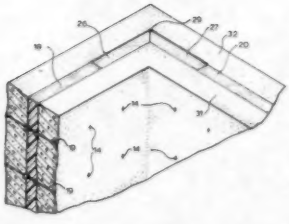
1. A roofing system comprising:
a roofing deck having a substantially continuous top surface area extending over the space covered by the roof;
a synthetic fiber needled fabric flexible porous layer covering said top surface, the fibers in said layer coated with asphalt but without fiber-free asphalt retained within the interstices of the fabric;
means for adhering said flexible layer to said top surface; and
a waterproof asphalt saturant applied in situ to the top surface of said layer to form a continuous waterproof coating which bonds by absorption in the upper lattice structure of the said fabric layer.

4,393,635

INSULATED WALL CONSTRUCTION APPARATUS

Robert T. Long, 3216 Shasta Ct., NE., Cedar Rapids, Iowa 52402

Filed Apr. 30, 1981, Ser. No. 259,039
Int. Cl.³ E04B 2/84, 1/74; E04C 2/26
U.S. Cl. 52—309.11 15 Claims



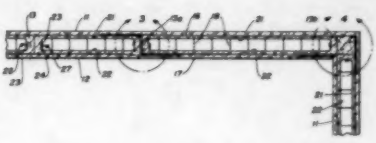
1. An insulating wall comprising two spaced outer layers of form-poured concrete; a high density insulating board disposed between said outer layers; a plurality of rods extending perpendicularly through said insulating layer and further extending substantially from respective outer surfaces of said outer layers; and a plurality of retainer means mounted to receive and immovably hold a rod for fixing the lateral position of said rods with respect to said insulation layer, whereby said rods abut said form during pouring of said concrete to retain said interior layer substantially immovably during pouring and are retained in said concrete after curing for forming a mechanical connection between said interior layer and each of said outer layers, wherein said retainer means comprises a pair of spools formed with central openings that can be inserted into opposite sides of said insulating board, wherein said spools each have an enlarged outer flange that can be depressed into the surface of said board and a central portion smaller than said flange, and wherein said spools also each have an inner portion which is larger than said central portion for locking said spool to said board.

4,393,636

BOX BEAM REINFORCED CONCRETE STRUCTURE

Raymond H. Rockstead, and Christopher A. Rockstead, both of 10041 Tesla Rd., Livermore, Calif. 94550

Filed Sep. 24, 1980, Ser. No. 190,355
Int. Cl.³ E04B 1/16
U.S. Cl. 52—381 3 Claims



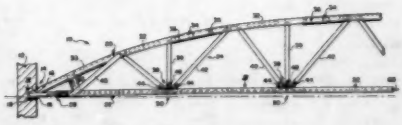
1. The combination of integrated spaced apart parallel concrete skin walls and an elongated monolithic solid concrete core connecting said walls;
flexible wire mesh sections embedded in said walls and said core and being positioned to provide continuous reinforcement extending medially of said walls and across said core;
a plurality of sinuous truss wires each extending between and having its apexes fixed to and providing an uninterrupted continuous wire connection between and supporting said sections in spaced apart substantially parallel planes with said apexes embedded in said walls;
a pair of flexible frangible sheets mounted on and solely supported by said truss wires one interiorly of and substantially parallel to each of said sections in spaced relation thereto and providing backing for concrete forming said walls with said sections embedded medially in said walls;
said sheets permitting cutting thereof to provide selectively positioned sheet ends folded transversely and interiorly to form spaced apart backing walls on opposite sides of and generally parallel to one of said truss wires for supporting plastic concrete forming said core contiguous to and integrated with said skin walls; and
said last-named truss wire extending through and being embedded in said core and having its length extending longitudinally of said core.

4,393,637

WOOD ROOF TRUSS CONSTRUCTION

Leo D. Mosier, 322 Euclid, Sheboygan, Wis. 53081

Filed Oct. 10, 1980, Ser. No. 196,075
Int. Cl.³ E04B 1/32
U.S. Cl. 52—644 14 Claims



1. A roof truss construction comprising a pair of redundant super-positioned load resisting force systems, said systems formed of a coincident top chord, a web system depending from said top chord and a pair of individually functioning bottom chords, one of said chords being a word bichord including lap-splices, connected to said web system and the other

chord comprising tension rod means disposed longitudinally within said bichord generally parallel thereto and means supporting said tension rod independent of said bichord, said web system including web clusters each comprising a vertical and diagonal strut members depending from said top chord and converging at a common point at the bottom chord, plate means at the point of convergence secured to the bottom ends of each converging strut member, said plate means having first passage means formed horizontally therein and strap means secured to and depending from said plate means and having second passage means formed longitudinally therein for supporting the rod without fixed attachment and said second passage means being aligned in said web cluster and containing spacer means passing therethrough whereby to secure said web cluster to said bottom bichord.

4,393,638

ANCHOR ROD, METHOD OF SETTING IT IN PLACE AND METHOD OF ITS MANUFACTURE

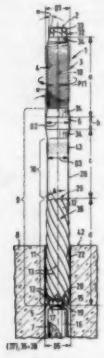
Rudolf Sell, Munich, and Herbert Kistner, Freiburg, both of Fed. Rep. of Germany, assignors to Upat GmbH & Co., Fed. Rep. of Germany

Filed Oct. 15, 1980, Ser. No. 197,271

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1979, 2941769

Int. Cl.³ E04B *1/38*

U.S. Cl. 52—704 **23 Claims**



1. An anchor rod for setting in and fastening, with the use of a hardenable mortar, to concrete and similar structural matrices into which a prebore which closely fits the portions of greatest diameter of said anchor rod has been prepared, said anchor having first and second extremities and comprising:

a connection portion at or near the first extremity of the rod designed to remain outside of the prebore and to provide for fastening an object to said rod or to said concrete or structural matrix;

an insertion portion provided, in a region thereof extending substantially to the second extremity (5) of the rod, with profiling for causing mortar and abrasive grains mixed therewith to be carried along by rotation of said anchor rod during insertion thereof, said profiling being provided in the form of a multiplicity of outwardly extending uniformly spaced ridges running in an axially directed steep-pitch spiral configuration providing grooves (12) between adjacent ridges, said ridges each having a slight trough-like concavity (24) running between a pair of outwardly directed apices (23).

4,393,639

REINFORCING ELEMENT AND PROCESS FOR ITS MANUFACTURE

Franz Bucher, Reut-Nicolussi-Str. 12, A-6020 Innsbruck, Austria

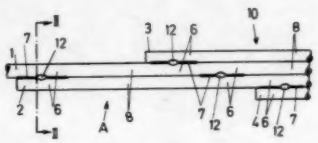
PCT No. PCT/AT80/00003, § 371 Date Oct. 27, 1980, § 102(e) Date Oct. 24, 1980, PCT Pub. No. WO80/01818, PCT Pub. Date Sep. 4, 1980

PCT Filed Jan. 29, 1980, Ser. No. 212,718

Claims priority, application Austria, Feb. 27, 1979, 1484/79

Int. Cl.³ E04C *5/02*

U.S. Cl. 52—730 **11 Claims**



1. A reinforcing insert to be embedded in a tension zone of a ferroconcrete member, comprising an assembly of parallel, closely juxtaposed steel rods including at least one through-going main rod and at least one ancillary rod of lesser length adjoining same, said ancillary rod being connected with said main rod along a plurality of elongate stretches, two of said stretches being located at the ends of said ancillary rod which are offset from the extremities of said main rod to an extent letting the tensile strength of said assembly vary in approximate conformity with the moment line of said ferroconcrete member, said stretches having cross-sectional areas of sufficient strength to transfer the tensile stress of said ancillary rod from the ends thereof to said main rod.

4,393,640

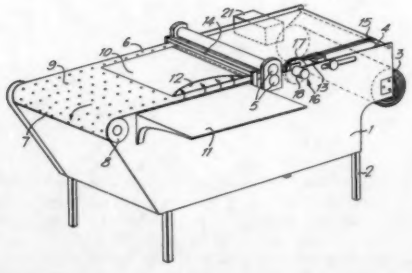
METHOD AND APPARATUS FOR HANDLING AND FILLING BAGS OR ENVELOPES

Denis B. Cole, Honiton, and Derek C. Trethewy, Esher, both of England, assignors to Hazelwood Enterprises Limited, Alderney, Channel Islands

Filed Aug. 28, 1980, Ser. No. 182,182

Int. Cl.³ B65B *9/08, 43/30, 43/36*

U.S. Cl. 53—69 **17 Claims**



1. Apparatus for handling flexible fillable containers selected from the group consisting of preformed bags and envelopes, comprising:

means for mounting a continuous length supply consisting of a series of similar preformed flexible fillable containers, each separated from its respective neighbour(s) by a tear-line allowing detachment of the leading endmost such flexible fillable container from the continuous length supply, each such container being open at one marginal edge

of the continuous length supply for insertion thereinto of a filling material;

means for intermittently advancing the free end of the continuous length supply;

a surface on which the flexible fillable containers are arranged to travel under control of said advancing means;

a filling station for said flexible fillable containers located at a predetermined location along said surface;

intermittently operable suction means located at said filling station for holding the leading endmost flexible fillable container of the supply in a predetermined position and selected orientation at said filling station;

intermittently operable blowing means for directing a stream of air towards the opening of the said endmost container while held by the suction means, and into the said container to thereby hold the same open for the insertion of a said filling material; and

intermittently operable clamping bar means located immediately upstream of said filling station and adapted in operation to clamp the leading edge of the flexible fillable container next adjacent in said continuous supply to said endmost container at least for a period of time after filling of said endmost container is complete, thereby enabling ready detachment of the filled endmost container from said continuous supply along the tear-line separating said endmost and said next adjacent containers, to leave said filling station free for receipt of said next adjacent container.

4,393,641

DEVICE FOR CLOSING GATHERED ENDS OF WRAPPERS WITH U-SHAPED CLIPS

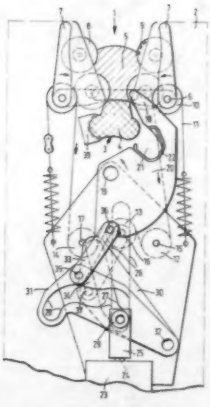
Herbert Niedecker, Am Ellerhang 6, Königstein 2, Fed. Rep. of Germany (6240)

Filed May 20, 1981, Ser. No. 265,272

Claims priority, application Fed. Rep. of Germany, May 29, 1980, 3020325

Int. Cl.³ B65B *61/00*

U.S. Cl. 53—138 A **4 Claims**



1. In a device for closing a U-shaped clip about the gathered end of a wrapper and comprising a housing carrying a clip-closing die, a punch pivotally mounted on said die to move from inoperative to clip-closing position in cooperation with said die, means for supplying clips to said punch, and means for moving said punch from inoperative to clip-closing position, the improvement which comprises

(a) a wedge shaped opening provided in one end face of the housing, the opening widening adjacent its apex to form a space for receiving the gathered end;

(b) two gathering means pivotally mounted on the housing on opposite sides of the wedge-shaped opening so that, upon pivoting, a gathered end within the opening is caused to enter the receiving space;

(c) a gathering nose on the punch; and

(d) means operatively connecting the gathering arms and the punch so that only after the gathering arms have been closed the punch is pivoted so that the nose engages and further compacts the gathered end against the die whereupon the punch applies the clip about the gathered end, the clip being closed by the die.

4,393,642

SHEET RECEIVING AND STORAGE APPARATUS

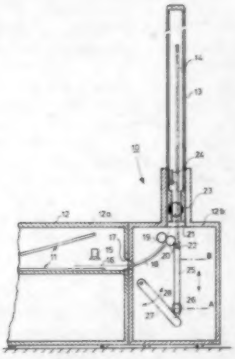
Hendrik S. Plessers, Wychmaal, and Julianus J. Hellemans, Kontich, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Apr. 6, 1981, Ser. No. 251,335

Claims priority, application United Kingdom, Apr. 9, 1980, 8011695

Int. Cl.³ B65B *5/06, 5/10, 7/00*

U.S. Cl. 53—266 R **14 Claims**



1. A sheet-receiving and storage apparatus comprising a housing having an entrance opening via which sheets can be fed one by one into its interior, an open-bottomed magazine releasably connected to said housing via said open bottom for receiving sheets from said housing in the same sequence and storing them as a stack, a sheet advancing mechanism for causing sheets entering said housing to advance to a rest position with their upper portions within said magazine and their trailing end portion extending through said open bottom into said housing, sheet supporting means normally disposed in a position underlying the trailing edges of a plurality of said sheets in said rest position and thereby supporting a stack of such sheets in face to face relationship in said rest position, a mechanism for elevating said sheet supporting means upwardly from its normal position thereby to raise the supported sheet stack bodily into the magazine, stack retaining means operative for retaining the raised stack of sheets in the magazine against the action of gravity after retraction of said sheet supporting means to its normal position, and closure means for light-tightly closing the bottom of said magazine after such retraction.

4,393,643

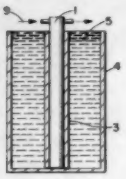
PROCESS FOR FORMING A BARRIER PHASE

Durward Fryar, Burlington, Ky., and Jerome J. Schmitz, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 306,808, Sep. 29, 1981, abandoned. This application Jul. 29, 1982, Ser. No. 402,870

Int. Cl.³ B29D *3/00*; **B65B** *7/28*

U.S. Cl. 53—471 **10 Claims**



1. A process for preparing a product containing two incompatible phases separated by a thin film barrier phase comprising:

A. dipping a pin of appropriate size and possessing heat transferring capability into a molten bath of the barrier phase material, said pin's outer surface having a temperature below the solidification temperature of said barrier phase.

B. withdrawing said pin from said barrier bath with a solidified film of said barrier material left on its surface;

C. placing the coated pin into an open end of a container designed to contain the product, the coated pin being placed tightly against an opposite end of said container which is closed;

D. putting a molten outer phase material into a space between said coated pin and the outer wall(s) of said container, maintaining the temperature of the outer surface of said coated pin below the solidification temperatures of the barrier phase and the outer phase materials thereby allowing the outer phase material to solidify;

E. increasing the temperature of said pin sufficiently to allow barrier phase material to attach to said solidified outer phase and removing said pin from said container; and;

F. pouring molten inner phase material into the space previously occupied by said pin and allowing said inner phase material to solidify.

7. A process according to claim **1** wherein the pin has cooling water circulating therein during the barrier forming step.

8. A process according to claim **7** wherein hot water is circulating within the pin during the barrier release and attachment to the outer phase step.

4,393,644

TWO-SPEED DRIVE APPARATUS FOR BLOWER FANS

Wayne B. Martenas, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Aug. 4, 1981, Ser. No. 289,869

Int. Cl.³ A01D *87/10*; **B02B** *1/02*

U.S. Cl. 56—12.8 **7 Claims**

1. In an agricultural machine including a frame, a blower fan supported on said frame for discharging crop material from said agricultural machine, and a main drive shaft supported on said frame for driving said blower fan, the improvement comprising:

(a) an input shaft connected to be rotated by said main drive shaft;

(b) said blower fan connected to rotate on said input shaft;

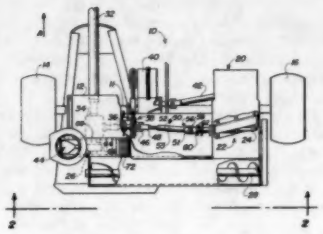
(c) a first gear connected to rotate with said input shaft;

(d) a second gear disposed on said input shaft;

(e) a third gear interconnecting said first and second gears;

(f) means connecting said third gear to said blower fan;

(g) means for selectively fixing said second gear to either of said input shaft and said frame;



(h) said blower fan being rotated at the same speed as said input shaft when said second gear is fixed to, and rotates with, said input shaft; and

(i) said blower fan being rotated at a slower speed than said input shaft when said second gear is fixed to said frame.

4,393,645

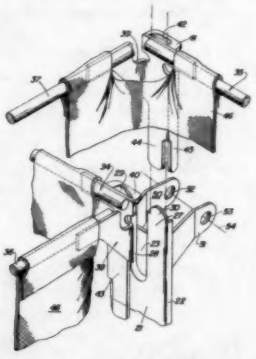
REAR BAGGER ATTACHMENT FOR LAWN MOWER

James W. Moore, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.

Filed Aug. 19, 1981, Ser. No. 294,261

Int. Cl.³ A01D *35/22*

U.S. Cl. 56—202 **13 Claims**



3. A bag assembly for a lawn mower carried in underslung relation on a vehicle having rear wheels supporting the vehicle frame, and in which the mower has a duct extending upwardly and rearwardly to a rear discharge portion terminating rearwardly of the vehicle and for directing grass clippings transverse of the vehicle, said bag assembly comprising: a bagger frame mounted on the vehicle frame; a pair of rod-like horizontally disposed rectangular-shaped bag supporting rims with adjacent fore-and-aft extending sides extending rearwardly from inner forward corners; a pair of bags suspended on and depending from the respective rims; structures at said corners rigid with the respective rims and projecting forwardly from said corners; means mounting said structures at said corners on the bagger frame for vertical sliding movement to and from lowermost positions in which said rims are slightly lower than the discharge portion and for suspending the respective rims and bags in cantilever fashion from said corners; and a bagger top hinged at a forward edge to the bagger frame and extending over the respective rims and having an opening receiving

and for passing material from the discharge portion of the duct into the top.

4,393,646

METHOD AND APPARATUS FOR JOINING YARN OR THREAD ENDS

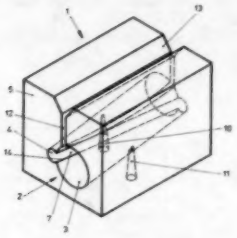
Sergio Lucchetta, Wädenswil, Switzerland, assignor to Maschinenfabrik Schweiter AG, Switzerland

Filed Dec. 1, 1981, Ser. No. 326,327

Claims priority, application Switzerland, Dec. 12, 1980, 9216/80

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—22 **8 Claims**



1. A method for splicing two yarn or thread ends in a splicing head of the type having a turbulence chamber for receiving the ends to be spliced together wherein the ends are subjected to centric pressure medium flow which is tangential to the periphery of the turbulence chamber so that the yarn or thread ends are subjected to turbulence and are twisted together to form a joint, including

providing two driving pressure medium flow streams to the turbulence chamber to form the pressure medium flow therein,

introducing the two driving flow streams into the turbulence chamber through inlets at opposite side walls thereof, the two streams at the inlets being parallel with each other, and

guiding the two driving flow streams in opposite directions along lemniscate-like paths through the turbulence chamber.

4,393,647

SNAIL WIRE ARRANGEMENT FOR YARN BREAKAGE DETECTION IN RING FRAMES

Yohji Kitamura, 1-18, Deguchi 1-chome, Hirakata-shi, Osaka, Japan

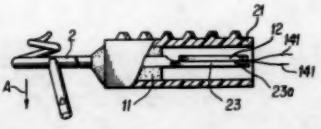
PCT No. PCT/JP81/00036, § 371 Date Aug. 20, 1981, § 102(e) Date Aug. 20, 1981, PCT Pub. No. W081/02433, PCT Pub. Date Sep. 3, 1981

PCT Filed Feb. 26, 1981, Ser. No. 296,424

Claims priority, application Japan, Feb. 27, 1980, 55-25200; Dec. 4, 1980, 55-174238; Dec. 4, 1980, 55-174239

Int. Cl.³ D01H *13/16*

U.S. Cl. 57—81 **3 Claims**



1. A yarn breakage detecting snail wire arrangement for ring frames and the like comprising:

a lappet;

a holder inserted into said lappet;

a resilient support member;

a snail wire supported, through said resilient support member, by said holder inserted into said lappet so as to contact running spinning yarns for producing inherent vibrations at a side portion of said snail wire; and

a piezo-electric element attached to a portion of said snail wire so as to detect said inherent vibrations for detecting presence of running spinning yarns, said snail wire being formed, at said portion thereof attached to said piezo-electric element along the face portion thereof, into a flat-shaped portion, said flat-shaped portion having a groove formed therein at a side face portion thereof opposite to said face portion attached to said piezo-electric element, and at approximately a central portion of said piezo-electric element in a direction intersecting at right angles with the axial direction of said snail wire so as to form a thin portion in said face portion of said snail wire attached to said piezo-electric element.

4,393,648

FIBER-GUIDING ELEMENT FOR OPEN END SPINNING MACHINES

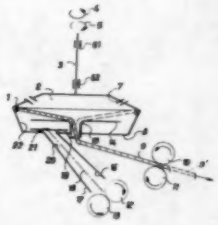
Miroslav Rambousek, Usti n Orl, and Stanislav Svarc, Dolni Dobrouc, both of Czechoslovakia, assignors to Elitex, koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Sep. 9, 1981, Ser. No. 300,598

Claims priority, application Czechoslovakia, Sep. 11, 1980, 6157-80

Int. Cl.³ D01H *7/882*

U.S. Cl. 57—413 **4 Claims**



1. In an open-end spinning machine having a hollow spinning rotor which may be rotated in either direction for the purpose of forming either yarn with a left-hand twist or yarn with a right-hand twist, the improvement which comprises a fiber-guiding element having an exit opening through which separated fibers are directed into the spinning rotor, the guiding element being fixedly mounted with respect to the rotor and having a left fiber-directing wall and a right fiber-directing wall, the left fiber-directing wall of said fiber-guiding element being oriented in a first direction substantially tangential to the then retreating collecting surface of the spinning rotor when the rotor is rotating in one direction, the opposite, right fiber-directing wall of the fiber-guiding element at the exit opening thereof within the rotor being oriented in a second direction opposite the said one direction and substantially tangential relative to the then retreating collecting surface of the spinning rotor when the rotor is rotating in the other, reverse direction.

4,393,649

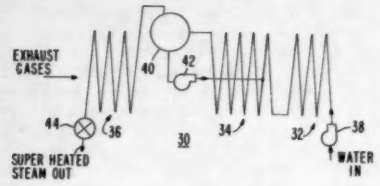
STEAM OUTPUT CONTROL SYSTEM

Dah Yu Cheng, Los Altos, Calif., assignor to International Power Technology, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 59,591, Jul. 23, 1979, Pat. No. 4,297,841. This application Aug. 4, 1980, Ser. No. 175,287

Int. Cl.³ F02C 7/00

U.S. Cl. 60—39.05 **15 Claims**



1. A heat engine comprising a dual fluid cycle engine having a counterflow heat exchanger, comprising at least an evaporator and a superheater section, for recovering waste heat from the engine exhaust gases to evaporator water into superheated steam for mixing with the engine combustion products, and having means for regulating the steam generation rate comprising a control valve located between the evaporator and superheater sections of the heat exchanger.

4,393,650

GAS TURBINE ENGINE HAVING AN AUTOMATIC ICE SHEDDING SPINNER

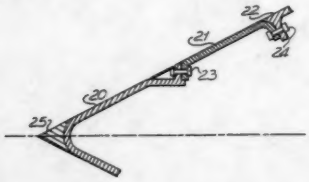
Francis C. Pool, Duffield, England, assignor to Rolls-Royce Limited, London, England

Continuation-in-part of Ser. No. 222,750, Jan. 6, 1981, abandoned, which is a continuation of Ser. No. 887,418, Mar. 15, 1978, abandoned. This application Feb. 20, 1981, Ser. No. 236,045

Claims priority, application United Kingdom, Apr. 20, 1977, 16318/77

Int. Cl.³ F02G 3/00

U.S. Cl. 60—39.093 **10 Claims**



1. In a gas turbine propulsion engine for aircraft in which thrust is provided only from flow of exhaust gases or a combination of flow of exhaust gases and by-pass air, said engine having an air inlet and an exhaust gas outlet, the improvement in a spinner positioned in the forward end of said air inlet for automatically shedding ice accretions at operational rotations of the engine, said spinner comprising:

a conical member having an included conical angle of substantially 57°, said conical member having a frusto-conical main body portion and a solid pointed cone-shaped tip portion attached thereto by a bond, said solid pointed cone-shaped tip portion of said spinner having an axial length relatively shorter than an axial length of said frusto-conical main body portion and said axial length of said solid pointed cone-shaped tip portion being no greater than 75 mm. and no less than 50 mm., said frusto-conical main body portion being manufactured from a material rigid at operational rotations of the spinner, and said solid pointed cone-shaped tip portion having at least a surface made of a different material from and flexible relative to said rigid material of said frusto-conical main body portion, said different material of the at least said surface of said solid pointed cone-shaped tip portion being flexible at said bond during operational rotation of the spinner causing local high stress levels to be produced and cracks propagated in any ice at said bond with surface deflection of the remainder of the at least said surface of said solid pointed cone-shaped tip portion causing any accretion of ice thereon to shed from the remainder of the spinner.

4,393,651

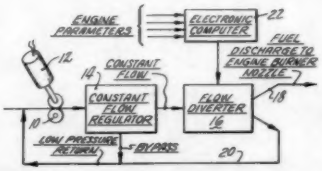
FUEL CONTROL METHOD AND APPARATUS

Robert E. Peck, Prospect, and Raymond D. Zagranski, Somers, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Filed Sep. 2, 1980, Ser. No. 183,059

Int. Cl.³ F02C 9/36

U.S. Cl. 60—39.281 **9 Claims**



1. In a fuel control for a gas turbine engine of the type having: a pump for delivering a pressurized flow of fuel; an inlet conduit for receiving fuel flow from the pump; a discharge conduit in fluid communication with the inlet conduit for delivering fuel to the engine; and a computer responsive to selected engine parameters for generating a signal indicative of a requested fuel flow, the improvement comprising:

a constant flow regulator fluidly connected to the pump and the inlet conduit for generating a constant flow of fuel in the inlet conduit;

a bypass conduit in fluid communication with the inlet side of the pump for returning fuel thereto; and

a flow diverter, having first and second outlet ports, positioned in the inlet conduit such that it receives the constant fuel flow therein and has the first and second outlet ports in respective fluid connection with the discharge conduit and the bypass conduit, the flow diverter including a flow dividing device responsive to the signal from the computer for apportioning the constant fuel flow between the first and second outlet ports so that the requested fuel flow is delivered to the discharge conduit and the remainder of the constant fuel flow is delivered to the bypass conduit.

4,393,652

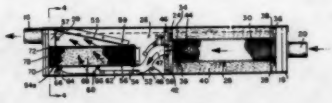
EXHAUST SYSTEM FOR INTERNAL COMBUSTION ENGINES

John H. Munro, 18 W. Mystic Ave., Mystic, Conn. 06355

Filed Jul. 23, 1980, Ser. No. 171,654

Int. Cl.³ F01N 3/02, 1/24, 3/20

U.S. Cl. 60—295 **3 Claims**



1. An exhaust system for connection to exhaust gas pipes of an internal combustion engine comprising a casing adapted for

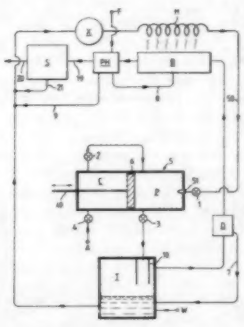
flow therethrough of exhaust gases from an upstream end to a downstream end of said casing, said casing having a muffler chamber at its upstream end, an intermediate spark and moisture arrester chamber and an exhaust gas purifier chamber at its downstream end, said muffler chamber comprising a removable foraminous cartridge having an axial opening therein for flow of exhaust gases therethrough and a sound attenuating material disposed about said cartridge, said removable foraminous cartridge containing a plurality of sound attenuating chambers decreasing in size from the upstream end to the downstream end and having openings for passage of sound waves from said chambers to said sound attenuating material, said intermediate chamber being filled with a heat and corrosion resistant strand material presenting a large number of surfaces serving to filtering out sparks and moisture and further muffling exhaust gases passing therethrough, said exhaust gas purifier chamber comprising a replaceable foraminous cartridge filled with small particles of exhaust gas purifying material, said purifying cartridge being supported in said gas purifier chamber by removable means whereby exhaust gases pass upwardly therethrough and whereby said cartridge may be withdrawn from said chamber for inspection or replacement of said cartridge.

4,393,653

RECIPROCATING EXTERNAL COMBUSTION ENGINE

Victor H. Fischer, Artarmon, Australia, assignor to Thermal Systems Limited, Grand Cayman, British West Indies

Filed Dec. 12, 1980, Ser. No. 215,867
Claims priority, application Australia, Jul. 16, 1980, PE4554
Int. Cl.³ F01K *21/04*
U.S. Cl. 60—511 **25 Claims**



1. A method of operating a reciprocating external combustion engine having a cylinder and a piston therein defining a working end space, wherein energy is transferred to a working gas from a heated vaporizable liquid heat transfer medium, which comprises

(1) inducting working gas into the end space;

(2) generating externally of the cylinder heated heat-transfer medium under a pressure such as to maintain the medium in the liquid state;

(3) after induction, injecting heated liquid medium into the working gas and allowing at least part of the liquid medium to vaporize, so as to raise the internal energy of the gas;

(4) in an expansion stroke of the piston, allowing the wet gas containing the heat-transfer medium to expand thereby driving the piston;

(5) exhausting wet gas from the end space near the end of the expansion stroke;

(6) separating liquid heat-transfer medium from wet exhaust gas containing heat-transfer medium vapor; and

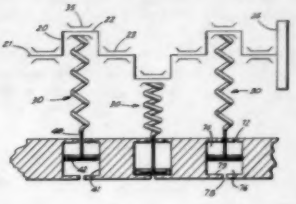
(7) recycling the separated liquid medium to stage (2) above.

4,393,654

SHAPE MEMORY ELEMENT ENGINE

L. Ronald Pelly, Box 385, Fillmore, Calif. 93015

Continuation-in-part of Ser. No. 56,429, Jul. 10, 1979, abandoned. This application Jun. 18, 1981, Ser. No. 275,101
Int. Cl.³ F03G *7/06*
U.S. Cl. 60—527 **5 Claims**



1. A mechanism for transforming heat energy into mechanical energy comprising:

a. a plurality of deformable shape memory elements having inner surfaces and responsive to form changes at a predetermined transition temperature;

b. a hot fluid incorporating a temperature above said transition temperature of said shape memory elements;

c. a cold fluid incorporating a temperature below said transition temperature of said shape memory elements; and

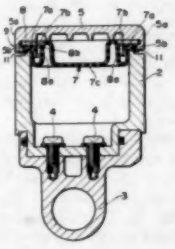
d. a crankshaft including at least one offset crankpin rotatably connected to one end of said shape memory elements, said crankpin incorporating fluid passageways for transporting, respectively, hot and cold fluids, said fluid passages sequentially and sealably cooperating with said inner surfaces of said shape memory elements whereby said cold fluid may contact said shape memory elements prior to deformation and said hot fluid may contact said shape memory elements prior to recovery.

4,393,655

RESERVOIR FOR A MASTER CYLINDER

Junichi Komorizono, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 12, 1981, Ser. No. 235,045
Claims priority, application Japan, Feb. 19, 1980, 55-19890[U]
Int. Cl.³ B60T *11/26*
U.S. Cl. 60—585 **3 Claims**



1. A reservoir for a master cylinder which comprises a reservoir body adapted to be placed above and secured to a master cylinder body and having a top opening defined by a top peripheral edge portion, a cap adapted to be secured to the reservoir body for closing the top opening, a flexible diaphragm disposed between the reservoir body and the cap, said diaphragm including a flexible portion substantially covering the top opening of the reservoir body and a peripheral portion

adapted to be interposed between the top peripheral edge portions of the reservoir body and the cap, a depressing plate interposed between the peripheral portions of the diaphragm and the cap, and restraining means provided on the depressing plate for engagement with the peripheral portion of the diaphragm to thereby restrain it from a radially inward movement, said cap being provided with a pair of hook-shaped portions for engagement with an outer edge of said depressing plate for securing said depressing plate to said cap, and said diaphragm being formed with a pair of inward projections engaging apertures in said depressing plate for securing said diaphragm to said depressing plate such that said cap, depressing plate, and diaphragm form a sub-assembly to be placed on the reservoir body.

4,393,656

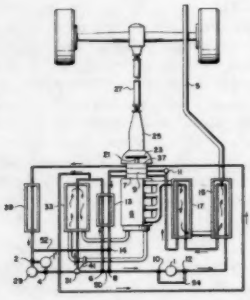
WASTE HEAT RECOVERY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Forest L. Anderson, 12186 Melody Dr., Denver, Colo. 80234, and Robert H. Nation, 13164 Elk Pl., Denver, Colo. 80239

Continuation-in-part of Ser. No. 204,855, Nov. 7, 1980, Pat. No. 4,351,155. This application Sep. 20, 1982, Ser. No. 420,494

Int. Cl.³ F01K *23/10*

U.S. Cl. 60—618 **18 Claims**



1. A method primarily intended for recovering and utilizing waste heat from the exhaust and coolant of an internal combustion engine by using a single working fluid, said method comprising the steps of:

(a) pumping liquified working fluid to a first location along a first path,

(b) vaporizing said working fluid at said first location along said first path to a high side temperature and pressure by applying waste heat from said exhaust,

(c) expanding said vaporized working fluid in said first path to produce work,

(d) condensing said expanded working fluid to a liquid state by removing heat therefrom,

(e) repeating steps (a)–(d) while simultaneously,

(f) pumping said liquified working fluid along a second path having at least two portions thereof in parallel,

(g) vaporizing said working fluid of step (f) in said parallel portions of said second path to high side temperatures and pressures less than the high side temperature and pressure of said first path by respectively applying waste heat in parallel from said coolant and the removed heat of step (d),

(h) expanding said vaporized working fluid in said second path to produce work,

(i) condensing said expanded working fluid of step (h) to a liquid state, and

(j) repeating steps (f)–(i).

4,393,657

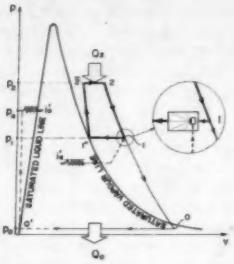
METHOD FOR RECOVERING WASTE HEAT AS MOTIVE POWER

Isao Takatama, 2-5-6 Kohokudai, Abiko, Chiba-ken, Japan

Filed Apr. 29, 1981, Ser. No. 258,732

Int. Cl.³ F01K *7/16*

U.S. Cl. 60—653 **4 Claims**



1. A novel method for the recovery of waste heat from a waste gas in the form of motive power in a cycle having a superheater provided on the upstream side and a counterflow heat exchanger on the downstream side respectively in the path of the waste gas to permit efficient recovery of the sensible heat of waste gas, characterized by injecting part of the high-pressure hot water brought to an elevated temperature by the heat absorbed within said counterflow heat exchanger into the circulation steam of the superheater system emanating from the outlet of said superheater thereby cooling the circulation steam into a saturated steam, returning the saturated steam to said superheater via the inlet thereof thereby enabling the saturated steam within said superheater to be converted into a superheated steam by the heat derived through the gas-gas heat exchange from the waste gas within said superheater, supplying a mass flow of the superheated steam equalling the amount of the hot water used for the aforementioned injection as the working steam for the steam turbine system to the steam turbine thereby causing the superheated steam within the steam turbine to be adiabatically expanded to generate motive power, subsequently introducing the expanded steam into the condenser to be condensed therein, introducing the resultant condensed cold water into said counterflow heat exchanger to be converted therein into a high-temperature, high-pressure hot water by the heat derived through the gas-liquid heat exchange from the waste gas within the heat exchanger, supplying the portion of the hot water remaining after deduction of the portion for use in the aforementioned cooling of the circulation steam to the hot water turbine to be adiabatically expanded therein to generate motive power, subsequently introducing the expanded hot water (wet steam) into the condenser to be condensed therein, and thereafter repeating the same heat cycles as described above sequentially one after another.

4,393,658

EXTRACTION CONDENSING TURBINE

Wulf Bohnenkamp, Düsseldorf-Wittlaer, and Gerd Hempel, Hamburg, both of Fed. Rep. of Germany, assignors to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 83,413, Oct. 10, 1979, abandoned. This application Jul. 10, 1981, Ser. No. 281,934

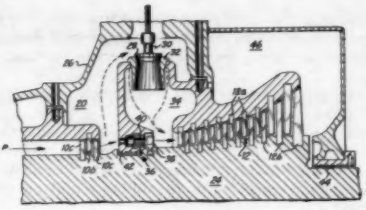
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1978, 2844681

Int. Cl.³ F01B *31/08*

U.S. Cl. 60—657 **6 Claims**

1. A steam extraction turbine comprising: a high pressure turbine section; a low pressure turbine section from which steam is exhausted from said turbine; a steam extraction section arranged in the steam flow path intermediate said high and said

low pressure sections of said turbine from which steam is fed into said low pressure section; said steam extraction section including steam extraction chamber means fed from said high pressure section from which steam is extracted from said turbine for external use; valve means between said steam extraction chamber means and said low pressure section for controlling the amount of steam flowing therebetween; and cooling



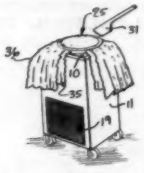
means defining a steam flow path between said steam extraction chamber means and said low pressure section in parallel with the flow path through said valve means for supplying steam to prevent overheating of said low pressure section, said cooling means including energy extraction means for extracting from the steam flowing through said cooling means energy which is applied to drive said turbine.

4,393,659

METHOD AND APPARATUS FOR PRODUCING STERILE SLUSH ICE

Richard M. Keyes, Lake Summerset, and Stephen W. Schwitters, Rockford, both of Ill., assignors to Taylor Freezer Company, Rockton, Ill.

Filed Jun. 1, 1982, Ser. No. 384,014
Int. Cl.³ F25C *1/00*
U.S. Cl. 62—66 **8 Claims**



1. A method of producing surgical sterile slush ice from a surgical sterile liquid for use in surgical procedures comprising:

(a) providing a portable refrigeration apparatus including a cabinet having an open top heat transfer basin at the top and depending side walls defining an enclosure, the refrigerating apparatus having refrigeration mechanism in the cabinet including an evaporator in heat transfer relation to the heat transfer basin and compressor means and condenser means and expansion control means connected in a closed refrigeration loop with the evaporator;

(b) providing a separate sterilizable product basin dimensioned to be removably receivable in the heat transfer basin;

(c) introducting a quantity of non-toxic heat transfer medium into the heat transfer basin;

(d) sterilizing the product basin to surgical sterility and positioning the product basin in the heat transfer basin for cooling of the product basin via the heat transfer medium;

(e) introducing a quantity of a surgical sterile liquid of a type suitable for subcutaneous administration into the product basin;

(f) operating the refrigeration mechanism to cause congealing of the surgical sterile liquid on the walls of the product basin;

(g) providing a sterilized scraping tool, and scraping ice off the walls of the product basin as the sterile liquid congeals thereon to produce loose sterile ice slush in the product basin; and

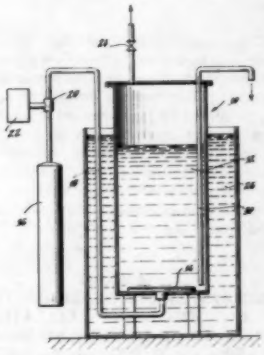
(h) allowing a quantity of the loose sterile ice slush to accumulate in the product basin and removing the loose sterile ice slush from the product basin for immediate use in surgical procedures.

4,393,660

QUIESCENT FORMATION OF GASIFIED ICE PRODUCT AND PROCESS

Fredric Kleiner, New City, N.Y., and Valery B. Zemelman, Wilton, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,233
Int. Cl.³ F25C *1/18*
U.S. Cl. 62—69 **4 Claims**



1. A process for preparing gasified ice characterized by a granular, crystalline porous structure, a brittle texture, good stability in its frozen state, and the ability to rapidly and quietly release its gas content to aqueous solution upon melting, which process comprises:

a. maintaining aqueous liquid in a pressurized vessel under conditions of temperature and pressure effective to form a stable gas hydrate upon contact with a conditionally-stable-hydrate-forming gas;

b. introducing finely-dispersed bubbles of a conditionally-stable-hydrate-forming gas into said aqueous liquid, at a pressure above that within said vessel to contact said liquid with said gas;

c. constantly withdrawing gas from said vessel to maintain a substantially constant pressure within said vessel;

d. maintaining said contact for a period of time effective to form a suspension comprising gas hydrate dispersed within said liquid;

e. freezing said suspension under pressure; and

f. separating unreacted aqueous liquid from said vessel prior to freezing.

4,393,661

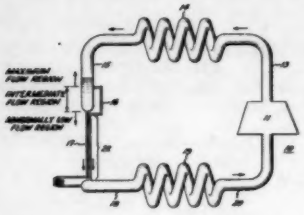
MEANS AND METHOD FOR REGULATING FLOWRATE IN A VAPOR COMPRESSION CYCLE DEVICE

Himanshu B. Vakil, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 10, 1981, Ser. No. 329,493
Int. Cl.³ F25B *41/00*
U.S. Cl. 62—113 **9 Claims**

1. A method for regulating the working fluid flowrate in a

vapor compression cycle device which comprises compressing a working fluid vapor in a compressor, condensing working fluid vapor in a condensing heat exchanger, passing a portion of the working fluid from said condensing heat exchanger through a first expansion device positioned so as to pass working fluid from the lower most section or termination of the output of said condensing heat exchanger, passing a portion of the working fluid from said condensing heat exchanger through a second expansion device positioned so as to pass working fluid from a region of the condensing heat exchanger



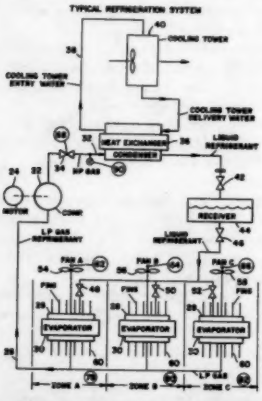
output which is upstream or higher than the inlet to said first expansion device, said working fluid flowing in said expansion devices being substantially in heat exchange relationship such that the working fluid flowing through said first expansion device can be cooled by the expanded working fluid flowing through said second expansion device, passing the working fluid from said expansion devices to an evaporating heat exchanger or to an evaporating heat exchanger and associated inlet tube of said compressor, evaporating the working fluid in said evaporative heat exchanger, and finally compressing the working fluid vapor for recirculation.

4,393,662

CONTROL SYSTEM FOR REFRIGERATION OR AIR CONDITIONING INSTALLATION

George P. Dirth, 504 Cambrian Way, San Ramon, Calif. 94583

Filed Sep. 28, 1981, Ser. No. 306,207
Int. Cl.[3] F25D *17/00*; G05D *23/32*
U.S. Cl. 62—115 9 Claims



1. A method for increasing the efficiency and reducing the power consumption of a refrigeration system have a compressor driven by a motor, first heat exchanger means with evaporator means located in a control zone and one or more additional zones to be cooled, said first heat exchanger means being connected to the compressor inlet, fan means associated with said first heat exchanger means, a conduit for liquid refrigerant interconnecting an outlet from said compressor to a second heat exchanger means, means for varying the load on said compressor, a liquid coolant means connected to said second heat exchanger means, a receiver for cooled liquid refrigerant connected to said second heat exchanger means, conduit means connected from the outlet of said receiver to said evaporator means of said first heat exchanger means, and expansion valve means in said conduit means, said method comprising the steps of:

establishing a desired set point temperature to be maintained in a predetermined one of said zones designated a control zone;

constantly measuring the actual temperature in said control zone;

establishing a continuous series of equal time sampling periods for said compressor;

operating said compressor at a relatively high load for a predetermined first portion of each time sampling period responsive to said measured temperature and at a relatively low load for the remaining or second portion of the sampling period;

during each time sampling period, determining the difference in the actual temperature from the set point temperature in the control zone;

calculating any change in the length of time for the first portion of the next sampling period required to maintain the set point temperature in the control zone from said difference;

controlling the compressor responsive to said calculation accordingly so that it is cycled from high load to low load during each time sampling period;

establishing a continuous series of equal time sampling periods for each of said fans or valves; and

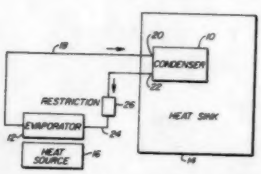
controlling the length of time during the first parts of said time sampling periods for each of said fans or valves that each of said fans or valves are turned on for purposes of zone temperature control.

4,393,663

TWO-PHASE THERMOSYPHON HEATER

Howard E. Grunes, and Dennis J. Morrison, both of Santa Cruz, Calif., assignors to Gas Research Institute, Chicago, Ill.

Filed Apr. 13, 1981, Ser. No. 253,817
Int. Cl.[3] F25D *15/00*
U.S. Cl. 62—119 12 Claims



1. Apparatus for transferring heat from a heat source to a heat sink via a vaporizable liquid when the apparatus is operating, the apparatus comprising

evaporator means at the heat source for heating the vaporizable liquid so that a portion of the liquid is vaporized to produce a moving stream of a heated liquid-vapor mixture;

condenser means at the heat sink, the condenser means having a inlet and an outlet, the inlet being communicatively coupled to the evaporator means for receiving the heated mixture, and wherein the condenser means extracts both sensible and latent heat from the heated mixture and condenses the vapor portion of the mixture back into liquid form, and wherein the outlet is communicatively coupled to the evaporator means for returning the cooled liquid and condensed vapor to the evaporator for reheating;

supply means for communicatively coupling the inlet of the condenser means to the evaporator means; and

return means for communicatively coupling the outlet of the

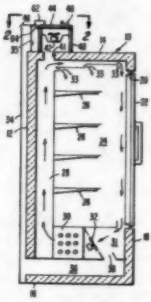
condenser means to the evaporator means, the return means further including restriction means for passing the cooled liquid and condensed vapor from the outlet of the condenser means to the evaporator means while impeding the flow of vapor from the evaporator means to the condenser means through the outlet of the condenser means by way of the return means when the apparatus is operating.

4,393,664

MULTIPLE DAMPER ASSEMBLY FOR REACH-IN CASES OF THE AIR DEFROST TYPE

George E. Wallace, Levittown, Pa., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Dec. 24, 1981, Ser. No. 334,482
Int. Cl.³ A47F 3/04
U.S. Cl. 62—256 10 Claims



1. In a refrigerated display case formed with an air inflow duct and an adjacent primary air passage having a refrigeration coil therein and respectively having inflow and exhaust openings for communicating said duct and passage with the ambient atmosphere during a defrost cycle, the improvement comprising:

(a) a first series of dampers controlling air flow through the exhaust openings;

(b) a second series of dampers controlling air flow through the inflow openings; and

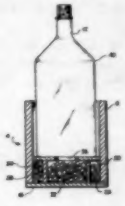
(c) means interengaging all of said dampers for joint simultaneous movement to open and closed positions respectively, the dampers of each series being arranged in a straight row, the row of dampers of the first series being parallel to the row of dampers of the second series, each damper of the first series being aligned transversely of said rows with a damper of the second series, the damper-interengaging means including an element extending between and rigidly connecting all the dampers of one of said series, said element being in the form of an elongated bar fixedly connected to each of the dampers of said one series and extending from end-to-end of said one series, the dampers of each series being hingedly mounted for movement between open and closed positions, all the dampers of each series being swingable about a common hinge axis, the hinge axes of the first and second series being parallel, said bar extending in parallel relation to said hinge axes, said damper-interengaging means including a cam on each damper of said one series and a tongue on the corresponding, transversely aligned damper of the other series engageable by the cam upon opening of the damper of said one series, the cams on the several dampers of said one series biasing the tongues of the several dampers of the other series when the dampers of said one series are moved to open position, for simultaneous movement of the dampers of the other series to open position conjointly with the dampers of said one series.

4,393,665

SERVER FOR WINE BOTTLES AND THE LIKE

James H. Gardner, and Noel H. deNevers, both of Salt Lake City, Utah, assignors to Aurora Design Associates, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 171,901, Jul. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 61,655, Jul. 30, 1979, Pat. No. 4,255,944. This application Mar. 30, 1981, Ser. No. 248,816
The portion of the term of this patent subsequent to Mar. 17, 1981, has been disclaimed.
Int. Cl.³ F25D 3/08
U.S. Cl. 62—457 9 Claims



1. A server for wine bottles and the like comprising

a housing open at the top for receiving a bottle and having a side wall shaped to conform to and surround the side exterior of the bottle and a bottom wall joined at its perimeter to said side wall, said side wall having a height of at least one-half the height of the enlarged portion of the bottle and being made of a heat conductive material, the side wall and bottom wall forming a receptacle means for holding ice in contact with said side wall to cause said side wall to absorb heat from the bottle if the bottle is at a higher temperature than the side wall, and to substantially prevent the transfer of ambient heat to the bottle, and

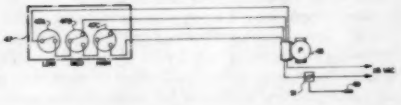
support means within said housing above said bottom wall to hold the bottle above and out of contact with the ice, said support means having openings therein to allow placement of ice into the receptacle means through the top opening of the housing.

4,393,666

BALANCED HEAT EXCHANGE ASSEMBLY

Doyle A. Revis, 9864 Monroe Dr., Dallas, Tex. 75220

Filed Oct. 14, 1980, Ser. No. 196,614
Int. Cl.³ F25B 27/02
U.S. Cl. 62—506 1 Claim



1. A heat exchange assembly for reclaiming heat from the refrigerant of an air conditioning system comprising:

a water circulation means;

a refrigerant circulation means;

a plurality of tube-in-tube heat exchange coils connected in parallel in the refrigerant and water circulation means to receive refrigerant in one tube and water in the other for heat exchange therebetween; and

means for ensuring a substantially equal rate of flow of refrigerant through each of the heat exchange coils, said means includes a refrigerant-in manifold pipe connecting the upstream end of the refrigerant tube of each of the coils to the refrigerant circulation circuit and a refriger-

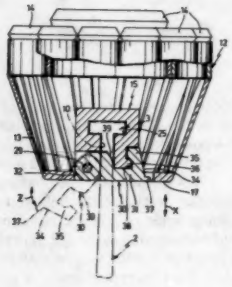
ant-out manifold pipe connecting the downstream end of the refrigerant tube of each coil to the refrigerant circulation circuit, said inlet manifold pipe having successive decreases of cross-sectional area downstream of each said upstream end connection and said outlet manifold pipe having successive increases of cross-sectional area upstream of each said downstream end connection.

4,393,667

JEWELRY ARTICLES

Martine Reinstein, Valkenlaan 14a, B-1800 Vilvoorde, Belgium, and Jacques Wurcel, Elfbunderslaan 18, B-1650 Beersel, Belgium

Filed Jun. 9, 1981, Ser. No. 271,875
Claims priority, application Belgium, Aug. 20, 1980, 201799
Int. Cl.³ A44C 17/02
U.S. Cl. 63—29 R 10 Claims



1. A jewelry article set comprising:

a support;

a setting having an ornamental element on a front face thereof and a backface;

male and female elements for coupling said backface of said setting to said support;

said female element being located and permanently fixed inside said setting and having a first groove which is open towards said backface of said setting and toward two opposite faces of said female element, said first groove having first and second parts, said first part of said first groove being broader than said second part, said second part of said first groove opening towards said backface of said setting and having an end which is substantially coplanar with said backface of said setting;

said male element having a shape complementary to that of said first groove so that when said male element is inserted into said first groove of said female element through one of said two opposite faces of said female element, both said male and female elements are hidden from view and it is impossible to disengage said male element from said female element through said second part of said first groove;

a blocking lever for fastening said male and female elements together, said blocking lever having one end connected to a pivot connected to said female element and having means on its other end for gripping said lever to a boss of said female element located inside said setting to fasten said blocking lever other end to said boss, when fastened said blocking lever extending within said setting and preventing a sliding movement between said male and female elements;

said male element being a part of said support; and

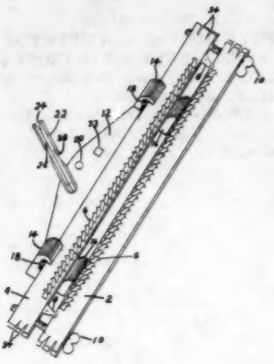
a notch provided in said support through which said blocking lever extends when it is fastened.

4,393,668

MANUAL KNITTING FRAME WITH SUPPORT

Clifford Leach, Sr., 1947 Woodglen La., #1, Vacaville, Calif. 95688

Filed Aug. 20, 1981, Ser. No. 294,679
Int. Cl.³ D04B 3/00
U.S. Cl. 66—4 6 Claims



1. In a knitting device, including a knitting frame comprising two spaced parallel bars, said bars having upper flat surfaces forming a plane and a row of pins substantially perpendicular to said plane on each of said bars; the improvement comprising a support for said frame, said support comprising a base plate, at least one upstanding hook-shaped locking member on said base plate, and at least one upstanding sustaining member on said base plate, said sustaining member being spaced from said locking member laterally of said base plate by a distance substantially the same as the width of one of said bars of said knitting frame, the hook of said locking member facing said sustaining member and the upper surface of said sustaining member being curved upwardly from said base plate and away from said locking member, said sustaining member being of such thickness that it will pass between the bars of said knitting frame, whereby said knitting frame can be laid on said support with one of said bars resting on said plate and within the hook of said locking member and against said sustaining member; and means for securing said support in a substantially fixed position.

4,393,669

AUTOMATIC LACING METHOD AND APPARATUS FOR MAKING PIECES WITH MULTIDIRECTIONAL WOVEN REINFORCEMENT

Georges J. J. Cahuzac, Le Bouscat, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jan. 27, 1981, Ser. No. 228,970
Claims priority, application France, Aug. 11, 1980, 80 17666
Int. Cl.³ D04B 9/44; D03D 41/00
U.S. Cl. 66—13 18 Claims

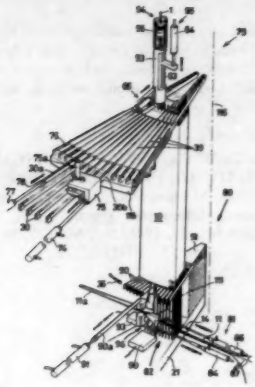
1. Method for automatically lacing reinforcements or woven pieces made by multidirectional weaving and composed of filiform textile elements disposed in several directions, one of the directions of weaving being initially materialised by temporary rigid rods which have to be replaced, in the course of lacing operations, by filiform textile elements, this method comprising the following steps of:

passing a needle through the woven piece, which needle simultaneously pushes a preselected rigid rod outwardly and chases it from the woven piece,

causing the needle to grip a textile element previously formed as a loop and

causing the needle, provided with the textile element thus

gripped, to pass through the woven piece in the opposite direction, said textile element thus gripped occupying the space vacated by the previously chased rigid rod,



disengaging the needle from the woven piece, and releasing it from the textile element.

4,393,670

AUTOMATIC KNITTING NEEDLE SELECTION DEVICE

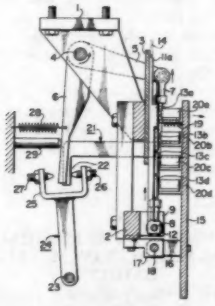
Takeji Hashimoto, Nagaokakyo; Kiyohumi Okumoto, and Masayasu Andoh, both of Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Japan

Filed Aug. 3, 1981, Ser. No. 289,258

Claims priority, application Japan, Aug. 20, 1980, 55-113421

Int. Cl.³ D04B 7/00, 15/66

U.S. Cl. 66—75.2 12 Claims



1. An automatic knitting needle selection device for forming knitting patterns in a knitting machine, comprising:

a plurality of vertically oriented knitting needles which can assume either a knit position or a non-knit position,

a plurality of vertically oriented selectors, provided in one-to-one relation with respect to the knitting needles and pivoted at their lower ends by a pivot shaft, which can assume either a first position adapted for moving the corresponding knitting needles from the non-knit position to the knit position and a second position adapted for not moving the corresponding knitting needles from the non-knit position to the knit position,

a plurality of solenoids, again provided in one-to-one relation relative to the selectors, for attracting a selected group from the selectors according to a desired knitting pattern,

a first drive means for moving the selectors other than those in the selected group from the first position to the second position, and

a second drive means for moving the selectors other than those belonging to the selected group so as to move the corresponding knitting needles from the non-knit position to the knit position.

4,393,671

APPARATUS FOR DYEING FIBER BY UTILIZING MICROWAVES

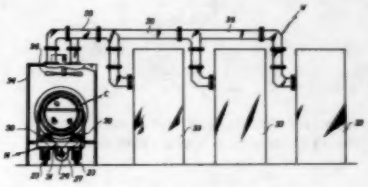
Hajime Ito, 2-32, Kamiotai, Nishi-Ku, Nagoya City, Aichi Prefecture, Japan

Filed Jan. 15, 1981, Ser. No. 225,437

Claims priority, application Japan, Jan. 19, 1980, 55-4687; Aug. 25, 1980, 55-117229

Int. Cl.³ D06B 3/02

U.S. Cl. 68—5 C 3 Claims



1. A fiber dyeing apparatus which comprises

(a) a vessel which is adapted to hold a quantity of fiber to be dyed, said vessel being formed of a material capable of transmitting microwaves, said vessel being formed of a gas tight pressure resisting sealed construction, said vessel being provided with a lid member to seal the vessel, said lid member being provided with a control valve to control the internal pressure of the vessel,

(b) a flat car located underneath said vessel so that the vessel can be moved from one place to another, said vessel being supported on said flatcar by rotary shafts that are connected with means to rotate them and thereby move the vessel rotatively,

(c) a radiation chamber extending around said vessel and said flatcar,

(d) a microwave generator, and

(e) a microwave guide for conducting microwaves from said microwave generator to said radiation chamber so that the vessels containing fiber that are located in said radiation chamber can be irradiated.

4,393,672

CYLINDER LOCK AND KEY ASSEMBLY

Egon Gelhard, Thomas-Mann-Strasse 10, D-5000 Köln 51, Fed. Rep. of Germany

PCT No. PCT/DE79/00144, § 371 Date Aug. 13, 1980, § 102(e) Date Aug. 13, 1980, PCT Pub. No. WO80/01299, PCT Pub. Date Jun. 26, 1980

PCT Filed Dec. 13, 1979, Ser. No. 204,401

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853655

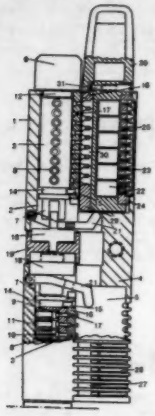
Int. Cl.³ E05B 47/00

U.S. Cl. 70—277 12 Claims

1. A cylinder lock and key assembly for effecting a mechanical and electro-mechanical locking, comprising:

a lock cylinder casing having a cylinder-receiving bore and a crosspiece offset from said bore in which a keyway is formed, a lock cylinder rotatably mounted in said cylinder-receiving bore of said casing, and a key receivable in said keyway, said key and said keyway being provided

with interchangeable and mechanically codable tumbler means for effecting a mechanical locking and electrical



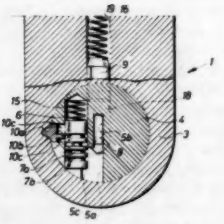
means for changing the flow of electric current for effecting an electromechanical locking signal.

4,393,673

CYLINDER LOCK

Bo G. Widen, Torshalla, Sweden, assignor to GKN Stenman AB, Eskiltuna, Sweden

Filed Jul. 2, 1980, Ser. No. 165,357
Claims priority, application Sweden, Jul. 10, 1979, 7906022
Int. Cl.³ E05B *19/06, 27/06*
U.S. Cl. 70—358 **5 Claims**



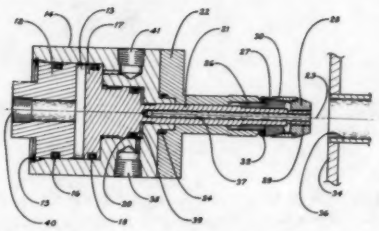
1. A cylinder lock comprising:
(a) a housing,
(b) a cylinder core mounted for rotation in said housing,
(c) a slot extending into the cylinder core parallel to the rotation axis thereof, for receiving a key,
(d) at least one row of locking pins guided in bores in said cylinder core and being movable against spring means by a key which engages ends of the pins when the key is inserted into the slot,
(e) at least one side bar accommodated in a recess extending axially in a peripheral part of the cylinder core, said at least one side bar being spring biassed outwardly of the cylinder into engagement with a recess in the housing which recess is shaped to retract the side bar in the cylinder core upon turning of the cylinder core,
(f) said locking pins having operative waisted portions, and said at least one said side bar having a number of lugs which must engage in said waisted portions of said pins of a row to permit said retraction, said waisted portions of the pins of the or each row being identically positioned on said pins of said row with respect to said ends of the pins of the row, and said lugs being respectively positioned on said at least one side bar so as to engage said waisted portions when the pins of a row have been set in predetermined positions by the key when the key is in an operative position,
(g) said at least one side bar including guide portions which extend between the pins of a row at least when the side bar is retracted into the cylinder and engage with surfaces in the cylinder to resist misalignment of the side bar.

4,393,674

HYDRAULIC CHUCK DEVICE FOR ENGAGEMENT WITH THE INSIDE OF A TUBE

Robert Rasmussen, Minneapolis, Minn., assignor to Air-Mo Hydraulics, Inc., Minneapolis, Minn.

Filed Jun. 25, 1981, Ser. No. 277,206
Int. Cl.³ B21D *22/10*
U.S. Cl. 72—61 **9 Claims**



1. A hydraulic chuck device for use with the inside of a tube, comprising:
a body defining a chamber; a piston slideably mounted in said chamber; an axially centered stem means mounted at one end on said piston and having a passage along its axis; sleeve means slideably covering said stem means and mounted on said body; collet means operably connected to said stem means and said sleeve means such that relative movement of one with respect to the other causes activation of said collets;
first fluid means connected to said piston to cause relative movement between said stem means and said sleeve; and
second fluid means connected to said stem means for passage of fluid through said passage of said stem means into the inside of said tube.

4,393,675

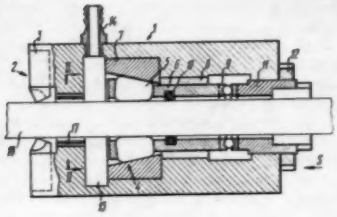
CONTRIVANCE FOR THE MACHINING OF CYLINDRICAL SURFACES ON METAL-CUTTING LATHES

Gennady M. Azarevich, ulitsa Akademika Yangelya, 14, korpus 2, kv. 257; Iosif A. Gusyatsky, ulitsa Malaya Bronnaya, 10, kv. 35; Lidia B. Savelieva, 9 Parkovaya ulitsa, 68, korpus 2, kv. 16, and Boris I. Akimov, Simonovsky val, 7, korpus 1, kv. 249, all of Moscow, U.S.S.R.

Filed Mar. 11, 1981, Ser. No. 242,521
Claims priority, application U.S.S.R., Apr. 25, 1980, 2916251
Int. Cl.³ B23B *27/10*; B24B *39/04*
U.S. Cl. 72—71 **2 Claims**

1. A contrivance for the machining of cylindrical surfaces on work supported for rotation on metal-cutting lathes comprising a housing; a tool head fixed inside said housing; at least one tool clamped in said tool head and having a cutting edge; a head with deforming rollers, said head being located in said housing behind said tool head; a system for feeding coolant-lubricant incorporating a source of coolant-lubricant, a chamber disposed in said housing between said tool head and said head with deforming rollers, said chamber being connected to said source of coolant-lubricant and to said head with deform-

ing rollers, at least one nozzle fitted in said housing between said chamber and said tool head so that the jet issuing therefrom is aimed at the cutting edge of at least one said tool, the



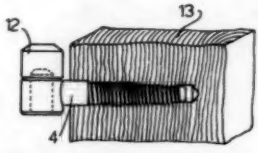
surface of said work defining one wall of said nozzle, and said nozzle confining the coolant-lubricant flow to direct and confine said flow to issue againt the cutting edge of said tool.

4,393,676

PROCESS FOR PRODUCING CONNECTING MEMBER SHANKS, SUCH AS HINGES FOR WINDOW AND DOOR FRAMES, FORMED OF CYLINDRICAL SECTIONS OF DIFFERENT DIAMETER, WITH CONTINUOUS EVEN SCREW THREAD, THAT IS WITH CONSTANT PITCH

Luciano Prosdocimo, Viale Grigoletti 73, Fontanafredda, Pordenone, Italy

Continuation-in-part of Ser. No. 898,162, Apr. 20, 1978, abandoned. This application Sep. 23, 1980, Ser. No. 189,820
Claims priority, application Italy, Jan. 31, 1978, 45704 A/78
Int. Cl.³ B21H *3/02*
U.S. Cl. 72—92 **3 Claims**



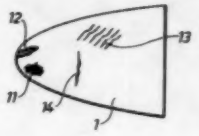
1. A method of forming a thread convolution with uniform pitch on a shank with at least two coaxial and essentially cylindrical portions of different diameters, the thread convolution on the shank being a leading face disposed at a first angle to the central axis of the shank, said method comprising the steps of providing a blank having two coaxial and essentially cylindrical portions connected by a sloping portion with the surface inclined at said first angle to the common axis of the two cylindrical portions, rolling said blank between a rotating chaser having two coaxial thread forming surfaces radially spaced apart by a distance equaling the difference in radius of said two different diameter portions of said blank and a fixed curved chaser having two thread forming surfaces radially spaced apart by a distance equal to the difference in the radius of said two different diameter portions of said blank, the larger diameter of said rotating chaser having a larger surface speed than the smaller diameter portion of said rotating chaser and being disposed in engagement with the smaller diameter portion of said blank, and guiding said blank during said rolling by abutting said sloping surface of said blank against sloping thread forming surfaces of said rotating chaser and said fixed chaser which connect said two thread forming surfaces of said rotating chaser and said fixed chaser, respectively, and which are parallel with said sloping surface of said blank to form a continuous uniform pitch thread convolution over and between the two essentially cylindrical portions of the blank.

4,393,677

PLUGS FOR USE IN PIERCING AND ELONGATING MILLS

Manabu Tamura, Kanagawa; Yoshiki Kamemura, Tokyo, and Masao Handa, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1980, Ser. No. 215,753
Claims priority, application Japan, Dec. 25, 1979, 54-167515
Int. Cl.³ B21B *19/04*
U.S. Cl. 72—97 **15 Claims**



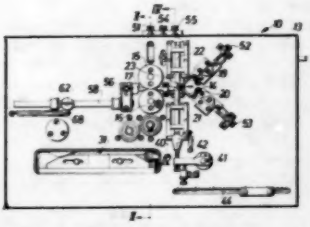
1. A plug for use in a piercing and elongating mill to manufacture seamless steel pipes having its surface coated with a highly adherent durable heat insulating layer consisting essentially of iron oxides comprising at least one oxide selected from the group consisting of FeO, Fe_3O_4, and Fe_2O_3 which had been formed on the surface of said plug by spraying molten powder consisting essentially of iron oxide onto the surface of the plug to form said layer, said iron oxide molten powder which is sprayed onto the surface of said plug also contains at least one metal or oxide selected from the group consisting of the oxides of chromium, nickel, copper and manganese, and the metals iron, chromium, nickel, cobalt, copper and manganese.

4,393,678

SPRING COILING MACHINE

Guido Favot, and Alf A. Berg, both of Västeras, Sweden, assignors to Tekno-Detaljer Sture Carlsson AB, Vallingby, Sweden

Filed Dec. 22, 1980, Ser. No. 218,795
Int. Cl.³ B21F *3/02, 11/00*
U.S. Cl. 72—131 **10 Claims**



1. A spring coiling machine, comprising two cooperating rotatable wire feeding rollers and a driving device for said wire feeding rollers by which said rollers may be rotated in order to feed a wire in its longitudinal direction between said rollers to a spring forming station, where wire bending tools are provided to cause the wire, as it reaches said station, to be successively bent so as to form a coiled spring by being brought into contact with said bending tools with successive portions thereof, and where a separate movable pitch controlling tool is provided to control the pitch of said spring along the length thereof through engagement with said wire, a cam follower being connected to said pitch controlling tool to control the position thereof through cooperation with a movable cam curve operatively connected to said driving device, wherein said cam curve defined by a plurality of distinct portions which are longitudinally displaceable relative to each other, said cam

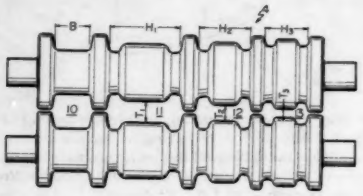
curve being mounted for reciprocating rectilinear movement in unison with a reciprocating gear rack included in said driving device.

4,393,679

METHOD FOR PRODUCING BLANK FOR WIDE FLANGE BEAM

Yoshiaki Kusaba, Ibaraki, Japan, assignor to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Nov. 21, 1980, Ser. No. 209,299
Claims priority, application Japan, Dec. 29, 1979, 54-172089
Int. Cl.³ B21B 1/08
U.S. Cl. 72—221 3 Claims



1. A method for producing a blank for a wide flange beam, said method comprising:

forming a box caliber, at least one forming caliber and a sizing caliber by a pair of rolls of a break-down mill;

providing a flat slab as raw material with said flat slab having a rectangular ratio of width to thickness of from 3 to 6;

conducting a former stage of a rolling process by edging said raw material by said box caliber with the widthwise dimension of said material maintained vertically until the total reduction of said width is 30%, and then reducing said material, mainly in a web portion thereof, by said forming caliber, with the widthwise dimension of said web maintained horizontally, into a dog-bone-shaped workpiece having a rectangular ratio which substantially is equal to that of said raw material;

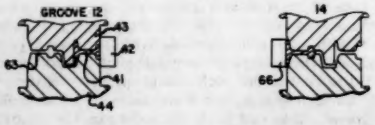
conducting a latter stage of said rolling process by edging said workpiece to reduce the width thereof by said box caliber with said web maintained vertically, and web-rolling said workpiece to reduce the thickness of said web by said sizing caliber with said web maintained horizontally, thereby forming said workpiece into a desired blank for a flange beam and providing said forming and sizing calibers to be sequentially smaller in width.

4,393,680

METHOD FOR ROLLING RAILS

Daniel C. Kovacs, Pittsburgh, Pa., assignor to SMS Schloemann-Siemag, Inc., Pittsburgh, Pa.

Filed Jul. 30, 1981, Ser. No. 288,413
Int. Cl.³ B21B 31/08
U.S. Cl. 72—234 10 Claims



1. A method of hot-rolling elongated workpieces to form a rail or the like according to a schedule of roll passes in a rolling mill train which includes at least two rolling mill stands each having a pair of horizontal rolls and at least one vertical roll, said method including the steps of:

providing each of said rolling mill stands with rolls defining two different roll-pass openings having preselected configurations to process a heated workpiece according to said schedule at only one of two different preselected locations in the rolling mill train, said vertical roll and a pair of horizontal rolls establishing one of the two different roll-pass openings in each rolling mill stand,

rolling heated workpieces in a designated one of the two roll-pass openings in each of the rolling mill stands,

replacing at least the horizontal rolls at one location with a pair of horizontal rolls after use at a different location to utilize an unused roll-pass opening at the previous location to process workpieces according to said schedule, and

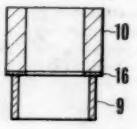
rolling additional heated workpieces in said unused roll-pass opening.

4,393,681

METHOD OF MANUFACTURING HERMETIC SEALING MEMBER

Masao Sakai, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 23, 1980, Ser. No. 171,643
Claims priority, application Japan, Jul. 23, 1979, 54-92674
Int. Cl.³ B21D 31/02
U.S. Cl. 72—329 6 Claims



1. A method of manufacturing a hermetic seal member including a metal cylinder, at least one end thereof being adapted to be soldered to another member to form a hermetic sealing structure, comprising the steps of deforming a metal plate into a cup-shaped member, pressing the periphery only of at least one end surface of said cup-shaped member to compress a portion of said end surface periphery into an annular flat concentric with the longitudinal axis of said cup-shaped member, and making a concentric cut through said end surface at a diameter which leaves a portion of said annular flat as the remainder of said end surface of said cup-shaped member.

4,393,682

FEED BAR DRIVING APPARATUS FOR A TRANSFER PRESS

Shozo Imanishi, Sagamihara, Japan, assignor to Aida Engineering, Ltd., Kanagawa, Japan

Filed Aug. 7, 1981, Ser. No. 290,969
Claims priority, application Japan, Mar. 6, 1981, 56-31963
Int. Cl.³ B21D 43/04, 43/05; B65G 25/02
U.S. Cl. 72—405 10 Claims

1. A feed bar driving apparatus for a transfer press having two parallel feed bars, comprising:

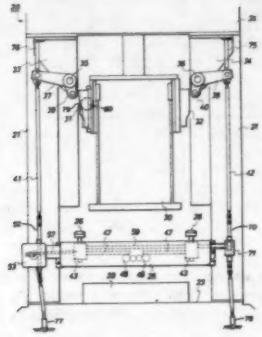
a pair of carriers located at each of the ends of the two parallel feed bars, said carriers each having vertically movable feed bar receptacles thereon for holding the feed bars for permitting them to slide freely in the direction of their length while restricting their movements in the lateral direction, the carriers in each pair being movable toward and away from each other for moving said feed bars in clamping and unclamping movements;

a rack mechanism between each pair of carriers and having a rack attached to each carrier, a pinion engaging each said rack, said pinions located at positions between the

corresponding carriers and the center of the space between the carriers, and an even number of idler gears connected between said pinions, for driving said pinions in opposite directions of rotation;

a cam carrying slide member reciprocally slidable on said press;

a reciprocating mechanism connected to one of said carriers in each pair and having a reciprocal motion producing cam on said slide member, reciprocating cam follower means actuated by said cam, and a connecting rod connected between said cam follower means and said one carrier for reciprocatingly driving said one carrier from the reciprocating sliding movement of said slide;



an elevating mechanism for said feed bar receptacles in each pair of carriers and having a splined shaft extending through both carriers in each pair and along which said carriers are slidable, an elevating plate in each carrier supporting the corresponding feed bar receptacle, a link means in each carrier connected between said splined shaft and said elevating plate for raising and lowering said elevating plate when said splined shaft is rotated; and

a rotation producing mechanism for each splined shaft and having a rotation producing cam on said slide member, rotation cam follower means actuated by said rotation producing cam, and a pinion on said splined shaft to which said rotation cam follower means is connected.

4,393,683

TRACTION DRIVE FOR FORGING MANIPULATORS

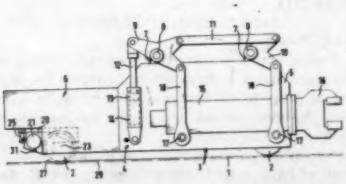
Werner Folta, Mettmann, and Erwin Kost, Meerbusch, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed May 27, 1981, Ser. No. 267,701

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1980, 3021519

Int. Cl.³ B21J *13/10*

U.S. Cl. 72—422 **6 Claims**



1. A forging manipulator comprising: a chassis; rail wheels rotatably mounted on said chassis for supporting the chassis so that said chassis can travel forwards and rearwards on rails, said chassis having a forward part and a rear part and forward rail wheels and rear rail wheels mounted respectively thereon; manipulating means mounted on the forward part of the chassis; laterally spaced side members on the rear part of said chassis; and a chassis drive unit mounted on the rear part of the chassis comprising, a transmission casing, a traction motor mounted on said casing, an output shaft extending from the transmission casing, bearing means for rotatably supporting said shaft on said casing, transmission means in said casing operably connecting said motor to said output shaft, a toothed wheel on said output shaft mounted directly adjacent said shaft bearing means for meshing with a stationary rack for moving said manipulator chassis along said rack and rails by said motor, said toothed wheel and output shaft being coaxial with respect to said rear rail wheels, transmission casing bearing means mounted on said side members in which the output shaft bearing means are journalled, and torque-absorbing means connecting said transmission casing to the rear part of the chassis.

4,393,684

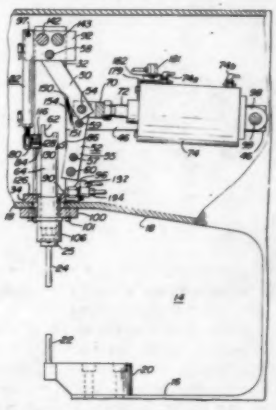
PRESS HAVING A LINKAGE MECHANISM CONNECTABLE AND DISCONNECTABLE FROM A RAM

David M. Hansen, Dublin, and Richard B. Ernest, Richboro, both of Pa., assignors to Penn Engineering & Manufacturing Corp., Danboro, Pa.

Filed Feb. 12, 1981, Ser. No. 233,942

Int. Cl.³ B21J *9/18*

U.S. Cl. 72—451 **9 Claims**



1. A press for assembling a fastener or the like to a plate or the like comprising

a frame,

an anvil assembly carried by said frame,

a toggle mechanism assembly carried by said frame and including two toggle links movable between retracted and extended positions,

a ram operatively connectable to said toggle links,

said toggle mechanism assembly when in said extended position being in contact with said ram and when said toggle mechanism assembly is in said retracted position being out of contact with said ram,

punch means connected to said ram,

pneumatic means for retracting and extending said toggle links and applying a force to said ram when one of said toggle links is in contact with said ram,

said pneumatic means including

a first pneumatic cylinder and piston assembly for holding said ram in a raised position,

first pneumatic switch means for terminating the flow of

pressurized air to said first pneumatic cylinder, thereby permitting said ram and punch means to descend by gravity to a lower position,

second pneumatic switch means activated after a sufficient descent of said ram and punch means toward said lower position, and

a second pneumatic cylinder piston and assembly operatively connected to said second pneumatic switch means for extending and retracting said toggle links,

whereby when said toggle links are extended and one of said toggle links is in contact with said ram a force sufficiently high to insert said fastener into said plate is applied by said toggle links to said ram and when said toggle links are retracted and one of said toggle links is out of contact with said ram no force is applied by said toggle links to said ram and said ram is permitted to descend and rise without contacting said toggle mechanism assembly.

4,393,685

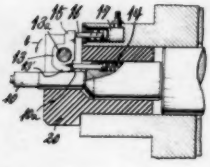
TOOL ATTACHING DEVICE FOR PRESSES

Yoshikazu Sakamura, 56, Kitamomodani-Cho, Minami-Ku, Osaka-Shi, Japan

Filed Feb. 23, 1981, Ser. No. 237,409

Int. Cl.³ B21J *13/02*

U.S. Cl. 72—481 **4 Claims**



1. A device for attaching a tool to a press, comprising:

(1) means for withdrawingly holding a tool therein, the tool inserted therein in a first direction;

(2) means, including a pressing member having an eccentric portion for preventing the tool when held in said holding means from slipping out of said holding means while in contact with the peripheral surface of the tool, pivotally mounted on said holding means and openly positioned for pivotal movement in a circumferential direction during insertion of the tool, for engaging the tool at said eccentric portion in biting contact therewith when the tool is held in said holding means, so as to exert a force thereon in a second direction opposite said first direction, said pressing member being provided with an unlocking lever including an elongated member;

(3) spring means for elastically biasing said pressing member in said second direction; and

(4) a fluid driven power pusher engagable with said elongated member for pivoting said unlocking lever in said circumferential direction against the bias of said spring means to pivot said pressing member to pivot said eccentric portion in said first direction so as to disengage said eccentric portion from the tool so that the tool can be withdrawn from said holder in said second direction; said elongated member being disengagable from said power pusher, whereby said pressing member can be pivoted in said circumferential direction by manually pivoting said elongated member to disengage said eccentric portion from the tool.

4,393,686

CIRCUIT ARRANGEMENT FOR A GAS MEASURING AND GAS ANALYSIS APPARATUS

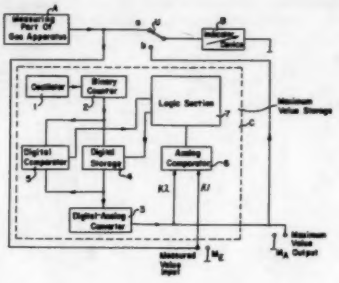
Hans-Jörg Fengler, Berlin, Fed. Rep. of Germany, assignor to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany

Filed Aug. 31, 1981, Ser. No. 298,015

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1980, 3031555

Int. Cl.³ G01N *31/00*

U.S. Cl. 73—23 **5 Claims**



1. A circuit arrangement for an apparatus for measuring and analyzing gases and consisting of a measuring part with an indicating and warning device, characterized by the provision of:

(a) a binary counter which is acted upon by an oscillator and which is connected to a digital-analog converter through a digital storage,

(b) a digital-comparator connected for comparing the binary values of the counter output from the binary counter and the input to the digital-analog converter,

(c) an analog comparator which is connected to a measured-value input from the measuring part and to a maximum value output of the digital-analog converter, the analog comparator connected to a digital section and adapted for actuating the digital logic section such that said logic section opens and closes the digital storage, and

(d) a chargeover switch located between the measuring part and the indicating device and connected for switching the maximum value output to the measured value input on the input of said indicating device.

4,393,687

SENSOR ARRANGEMENT

Klaus Müller, Tamm; Ernst Linder, Mühlacker, and Helmut Maurer, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 9, 1980, Ser. No. 214,481

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1980, 3001711

Int. Cl.³ G01L *23/22*; H01T *13/48*

U.S. Cl. 73—35 **7 Claims**

1. Engine knock sensor arrangement to detect oscillations arising upon knocking in an internal combustion engine due to undesired progress of the course of combustion within a combustion chamber thereof, said engine having a cylinder head seal (35);

and comprising sensing means including

a pair of light guide fibers or filaments (36, 37; 38, 39) positioned within the cylinder head seal;

light guide means in optically coupled relation with respect to said light guide fibers or filaments;

and photoelectric evaluation means (412) connected to said light guide means for photoelectric evaluation of light sensed by said light guide fibers or filaments.

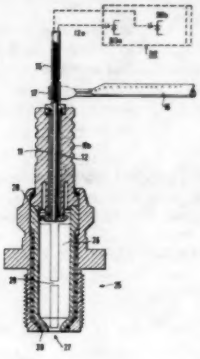
5. Combined spark plug and optical sensor structure having an electrical or sparking portion and an optical combustion observation portion to determine oscillations occurring upon knocking of an internal combustion engine having

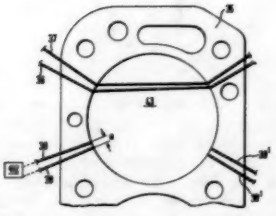
a housing (10) forming a ground or chassis electrode for the electrical portion, and having a spark gap ground electrode (10*a*) secured thereto;

a metal tube (11) extending centrally within the housing and forming a center electrode of the sparking portion terminating adjacent the ground electrode, and spaced therefrom by a spark gap;

a light guide element (12) located within the metal tube and terminating essentially even with the end of the tube adjacent the spark gap, but short of the end of the tube at the other end thereof;

an insulator (10*b*) located between said center electrode metal tube and the housing, electrically separating the





housing and the metal tube and supporting the metal tube, and the light guide element therein, within the housing;

a light pick-up surface (13, 20) formed at the end of the light guide element;

and a light guide cable (15) having an optical coupling surface positioned in optically coupled relation with respect to the light guide element (12) and located within the end portion of the metal tube (11) remote from the spark for connection of optical signals derived from the light guide element to an electrical evaluation circuit (112);

wherein the spark plug comprises an ante-chamber (26);

and wherein the light guide element comprises a light guide element portion (12*a*) recessed with respect to the end portion of said tube (11) and a further light guide portion (12*b*) terminating essentially flush with the end of said tube (11) to provide two different viewing apertures for the respective light guide element portions.

4,393,688

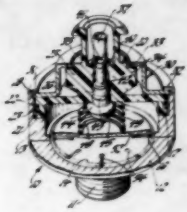
PIEZOELECTRIC KNOCK SENSOR

Daniel U. Johnston, and George A. Shinkle, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 19, 1981, Ser. No. 322,989

Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 **2 Claims**



1. A knock sensor for an internal combustion engine comprising, in combination:

a mounting element adapted for rigid attachment to the engine;

a flexing plate supported on the mounting element and adapted to execute plate vibrations in response to knock events in the engine, the plate having a surface comprising a plurality of raised radial ridges;

a piezoelectric disk affixed to the surface of the plate for flexure with vibrations thereof in abutment with the radial ridges by means of an adhesive substance between the raised radial ridges, said ridges providing internal electrical ground contact for one surface of the piezoelectric disk through the plate, mounting element and engine, as well as strain transmission between the plate and the disk;

a cover affixed to the periphery of the plate, the cover including an electric output terminal; and

spring means compressed between the cover and the other surface of the piezoelectric disk, said spring means being in electrical contact with the electric output terminal, the radial arrangement of said ridges permitting radial outflow of excess adhesive to permit the spring means to force the piezoelectric element into contact with said ridges, whereby good internal electrical ground contact in the sensor is assured.

4,393,689

DEVICE FOR DETERMINING PHYSICAL CHARACTERISTICS OF A FLUID, SUCH AS ITS LIQUID-VAPOR EQUILIBRIUM PRESSURE

Henri Renon, Paris, and Dominique Richon, Aulnay-sous-Bois, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison and Association pour la Recherche et le Developpment, Paris, both of, France

Filed Apr. 16, 1981, Ser. No. 254,722

Claims priority, application France, Apr. 16, 1980, 80 08568

Int. Cl.³ G01N *7/14*

U.S. Cl. 73—64.2 **10 Claims**

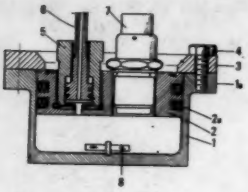
1. A device for determining physical characteristics of a fluid, such as its liquid-vapor equilibrium pressure or its volumetric mass, said device comprising in combination:

(a) a removable compact cell (1) adapted for being accurately weighed, said cell (1) comprising means (6) for introducing the fluid and means (8,9) for homogenizing and stirring the fluid contained therein, at least one measuring gauge (7), and said cell having a slidable wall (2);

(b) a pressurizing unit (10) adapted for having its temperature controlled, and provided with a housing (19) for receiving said removable cell (1); and

(c) means for reducing the internal volume of said cell (1)

comprising calibrated compression means (33) associated with said pressurizing unit (10) and operatively associated



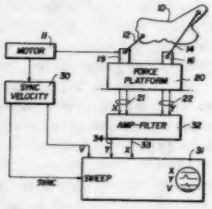
with said slidable wall (2) of said cell (1) for compressing the fluid contained therein.

4,393,690

FORCE BALANCING TECHNIQUES FOR COMPLEX CYCLICALLY MOVING PLANAR LINKAGES

Gerard G. Lowen, Wyckoff, and Stephen J. Tricamo, Norwood, both of N.J., assignors to Research Foundation of the City University of New York, New York, N.Y.

Filed May 12, 1981, Ser. No. 262,826
Int. Cl.[3] G01M *1/22*
U.S. Cl. 73—66 32 Claims



1. The method of fully force balancing cyclically moving planar n-bar linkages to reduce residual shaking forces comprising the steps of,

cyclically moving the planar linkage through its movement cycle,

determining during the cyclic movement in the plane of movement the shaking forces (F_x) along a set of two coordinates, such as the x and y axes, for a plurality of angular sensing positions in the movement cycle,

determining the angular position and angular velocity of the input link at said plurality of positions to thereby provide a plurality of sets of data,

and establishing from the plurality of sets of data determining the shaking forces at the plurality of sensing positions with the help of the balancing equations the required corrective mass and location of counterbalance structure for reducing the shaking forces F_x of both fundamental frequencies and harmonics of the cyclic movement.

4,393,691

RAIL VEHICLE FOR TRACK INVESTIGATION

Hermann D. Koehne, Printroper Str. 555, D-4300 Essen 11, Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,365
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1980, 3034704
Int. Cl.[3] G01N *3/42*
U.S. Cl. 73—84 24 Claims

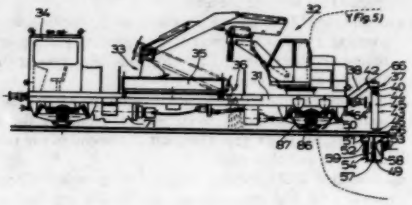
1. Rail vehicle for track investigation comprising

means attached to said vehicle for removing supporting material of the track disposed below the rail level;

a support provision attached to the rail vehicle;

a test unit attached to the support provision including: a frame supported by the support provision;

a pressure plate held by the frame and capable of being lowered down and lifted up and disposed in its upper rest



position such that it is at a level above the track region for preventing interference with line travel and capable of being lowered down to below the formation level; and

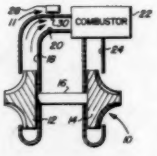
a pressure piston adapted to an opening in said pressure plate and capable of substantially vertical motion relative to the pressure plate for pressing into the subgrade to be tested.

4,393,692

STATIC PRESSURE PROBE AND METHOD

Walter L. Clark, Scottsdale, and Trevor G. Sutton, Tempe, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Feb. 21, 1978, Ser. No. 879,542
Int. Cl.[3] G01L *7/00*
U.S. Cl. 73—115 18 Claims



1. A probe for use in measuring static pressure of an airstream comprising:

a flow pickup tube having an open end disposed in a downstream direction relative to said airstream, said open end presenting an orifice of preselected size; and

a protective hood carried with said tube in surrounding relationship to said open end of the tube, said hood being substantially larger than said tube and having an open distal end disposed downstream of said orifice and presenting an opening communicating with said airstream, said opening being at least twice as large as said orifice.

4,393,693

APPARATUS AND METHOD FOR DETECTING CRANK SHAFT ORIENTATION AND VALVE ASSEMBLY IN AN INTERNAL COMBUSTION ENGINE

Tadashi Naito, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

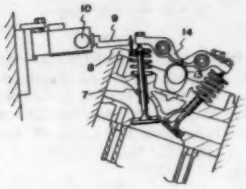
Filed Jan. 21, 1981, Ser. No. 226,544
Claims priority, application Japan, Jan. 22, 1980, 55-5980
Int. Cl.[3] F02P *17/00*; G01M *15/00*
U.S. Cl. 73—116 8 Claims

4. A method for automatically inspecting a multi-cylinder four-cycle internal combustion engine having a crankshaft; a piston, an intake valve, and an exhaust valve for each cylinder, each being operatively coupled to the crankshaft; and a mem-

ber rotatable with the crankshaft and having a detectable angular index, wherein the method comprises:

(a) turning the crankshaft of such an engine;

(b) detecting when the index on the rotatable member reaches a predetermined angular position corresponding to a top dead center position of a preselected piston;



(c) simultaneously measuring the positions of a plurality of preselected valves when the index is detected at the top dead center position; and

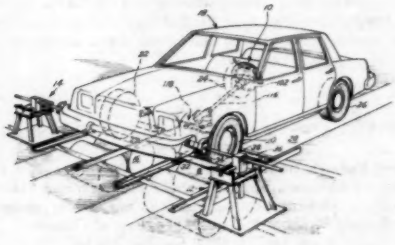
(d) distinguishing in response to the displacement values of the plurality of preselected valves whether the preselected piston is at its compression top dead center position or its exhaust top dead center position.

4,393,694

VEHICLE STEERING AND FRONT-END ALIGNMENT DEFECT DETECTOR

John A. Marten, Wauconda; Donald Legler, Fort Wayne, and Jesse W. Wagoner, Dundee, all of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Filed May 18, 1981, Ser. No. 264,647
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—117 **16 Claims**



1. An apparatus for detecting defects in vehicles having a front portion with a first side and a second side, a rear portion, at least two front wheels rotatably mounted in said front position, rear support means for mobile support of said rear portion, and steering means for steering said front wheels, said steering means including a steering rod rotatable around an axis of rotation, a steering wheel rotatably mounted about said axis of rotation and connected to said steering rod, and connecting means for steerably connecting said steering rod to said front wheels, said steering wheel being in a center position when said wheels are aligned for forward motion of said vehicle, said apparatus comprising:

wheel rotating means for rotating each of said front wheels of said vehicle when said steering wheel is turned through a relatively small angle of rotation to urge the front portion of the vehicle to move in the direction of the vehicle's first or second side;

first retaining means for retaining said first side of said vehicle from movement in the direction of the vehicle's first side, said first retaining means having a first urging force determining means for determining a first value of urging force exerted by said vehicle on said first retaining means when said steering wheel is rotated about the axis of rotation from said center position through a relatively small first angle of rotation to urge the first side of the vehicle against said first retaining means;

a second retaining means for retaining said second side of said vehicle from movement in the direction of the vehicle's second side, said second retaining means having a second urging force determining means for determining a second value of urging force exerted by said vehicle on said second retaining means when said steering wheel is rotated about the axis of rotation from said center position through a relatively small second angle of rotation to urge the second side of the vehicle against said second retaining means;

angular rotation measuring means for measuring the angular rotation of said steering wheel about the rotational axis of said steering wheel about the rotational axis of said steering rod whereby said first and second angles of rotation of said steering wheel can be made to be approximately equal in magnitude; and

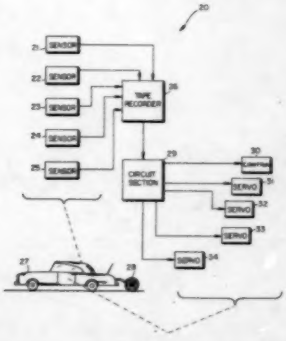
rotational force measuring means for measuring the force or torque exerted on said steering wheel during rotation of said steering wheel about the rotational axis of said steering rod and whereby a first value of rotating force can be obtained when the steering wheel is rotated through said first angle of rotation and a second value of rotating force can be obtained when the steering wheel is rotated through said second angle of rotation, so that the first and second urging force values and the first and second rotating force values can be mathematically compared to determine if a steering or front-end alignment defect exists in the auto.

4,393,695

MANUAL SHIFT SYSTEM AND METHOD OF USE FOR VEHICLE TESTING

Richard A. Marshall, and Edward F. Miller, both of Indianapolis, Ind., assignors to Laboratory Equipment Corp., Mooresville, Ind.

Filed Sep. 29, 1980, Ser. No. 191,868
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—117.3 **6 Claims**



1. A remote, manual shift system cooperatively arranged with the clutch linkage and gear shift stick of a manual transmission vehicle for use during vehicle testing, said manual shift system comprising:

a manual transmission test vehicle;

means for generating a DC voltage signal;

a first sensor assembly coupled to the throttle linkage of said vehicle and suitably arranged to respond to throttle linkage movements;

a second sensor assembly coupled to the clutch linkage of

said vehicle and suitably arranged to respond to clutch linkage movements;

a dual rotary sensor assembly coupled to the gear shift stick of said vehicle, said dual rotary sensor assembly suitably arranged to record the X-axis component of the movement of the gear shift stick by first sensor means and the Y-axis component of the movement of the gear shift stick by second sensor means, said dual rotary sensor assembly thereby providing real-time position information of the gear shift stick;

a clutch actuator subassembly mechanically coupled to the clutch linkage of said vehicle and suitably arranged to respond to a DC voltage signal from said generating means in order to move said clutch linkage;

a throttle actuator subassembly mechanically coupled to the throttle linkage of said vehicle and suitably arranged to respond to a DC voltage signal from said generating means to move said throttle linkage;

a gear shift actuator subassembly mechanically coupled to the gear shift stick of said vehicle and suitably arranged to respond to a DC voltage from said generating means signal to move said gear shift stick;

data recording and processing means electrically coupled to said first and second sensor assemblies and to said dual rotary sensor assembly; and

said gear shift actuator subassembly including a DC drive system, a linkage arm and a ball screw assembly suitably arranged for converting rotary motions from said DC drive system into linear travel of said linkage arm, said DC drive system disposed within said vehicle and being suitably adapted to respond to data input signals from said data recording and processing means for duplicating the real-time position movements of said gear shift stick.

4,393,696

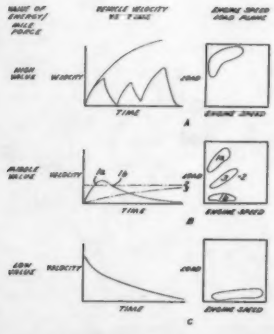
METHOD FOR GENERATING ENERGY OUTPUT SIGNAL

Frederick G. Willis, Ann Arbor; Richard R. Radtke, Plymouth; Joseph Ellison, Detroit, and Steven R. Fozo, Westland, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 20, 1981, Ser. No. 284,861

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—117.3 **11 Claims**



1. A method of generating an energy output signal for use in controlling the performance of a spark ignited automobile internal combustion engine, said method including the steps of:

generating a short term energy output average during a relatively short duration length of time;

generating a medium term energy output average during a medium duration length of time, said medium duration being longer than said short duration;

generating a long term energy output average during a relatively long duration of time, said long duration being longer than said medium duration;

generating an estimated future energy output by combining a weighted sum of the short term, medium term and long term energy outputs, the weighting being a coefficient A for the short term output, a coefficient B for the medium term output and a coefficient C for the long term output.

4,393,697

AIR FLOW RATE MEASURING APPARATUS

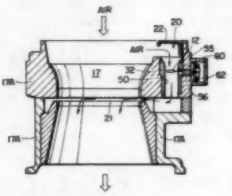
Kanemasa Sato; Sadayasu Ueno, and Kazuhiko Miya, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 30, 1981, Ser. No. 229,838

Claims priority, application Japan, Jan. 31, 1980, 55-11345

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—118 **15 Claims**



1. An air flow rate measuring apparatus for internal combustion engines, comprising an air flow sensor disposed in a passage through which intake air flows into said engine, and a temperature sensor disposed in said passage and adapted to compensate the temperature of said air flow sensor with respect to the measurement of the flow rate of said intake air, said air flow sensor and said temperature sensor being arranged in the same plane which is at right angles to the direction in which said intake air flows, wherein said air flow sensor and said temperature sensor are fixed at their respective end portions by conductive support pins having the same surface area and the same heat capacity.

4,393,698

DEVICE FOR MEASURING HOLLOW CYLINDER SURFACES

Ludwig Pietzsch, Im Rosengärtle 14, D-7500 Karlsruhe 41, Fed. Rep. of Germany; Knud Overlach, Ettlingen, and Manfred Wamser, Karlsruhe, both of Fed. Rep. of Germany, assignors to Ludwig Pietzsch, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 22, 1981, Ser. No. 276,159

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024331; Oct. 3, 1980, 3037519

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—118 **14 Claims**

1. Apparatus for measuring the inner surface of a generally cylindrical bore, comprising

(a) a housing (1) adapted for insertion within the bore;

(b) clamping jaw means (12) for clamping said housing within the bore;

(c) a longitudinal measuring arm (2) rotatably connected with said housing for rotation about, and extending longitudinally of, the bore axis;

(d) first drive means (5) for rotating said arm relative to said housing;

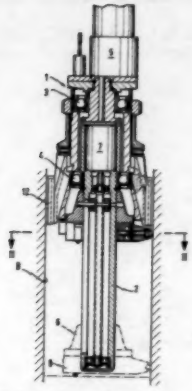
(e) a measuring head (8) connected with said measuring arm for axial displacement along the length thereof;

(f) second drive means (7) for axially displacing said measuring head relative to said arm;

(g) sensor means (9) connected for radical displacement relative to said measuring head;

(h) spring means (21) biasing said sensor means radially outwardly relative to said head toward a position in engagement with the inner surface of the bore; and

(i) means responsive to the deflection of said spring for generating an electrical signal corresponding with the



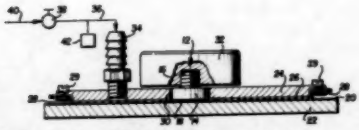
radial displacement of said sensor means relative to said measuring head, thereby to afford an indication of the inner surface contour of the bore.

4,393,699

PNEUMATIC ADHESION TESTER

James F. N. Seiler, Jr., Frederick, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Jun. 11, 1981, Ser. No. 272,231
Int. Cl.³ G01N *19/08*
U.S. Cl. 73—150 A **4 Claims**



1. A pneumatic adhesion tester comprising:

a fixture having a bonding surface adapted to be bonded to a coated or uncoated substrate,

a plate and a membrane sealed together solely along their outer peripheries, said membrane being adapted to directly contact said coated or uncoated substrate,

a hole extending through said membrane and at least into said plate for receiving said fixture so that said bonding surface is substantially flush with said membrane,

means for introducing a pressurized gas between said plate and membrane, said membrane having said hole being adapted to be thereby pressed into gas-tight contact with said coated or uncoated substrate, said bonding surface remaining flush with said membrane until the bonding surface separates, and

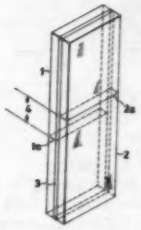
means for measuring the pressure of said gas introduced between said plate and membrane.

4,393,700

PROCESS AND TEST SPECIMEN FOR DETERMINING THE ADHESION TO GLASS OF INTERLAYERS FOR LAMINATED GLASS BY THE TENSILE SHEAR TEST

Klaus Fabian, Kriftel, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 9, 1981, Ser. No. 310,072
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 3038449
Int. Cl.³ G01N *3/24*
U.S. Cl. 73—150 A **4 Claims**



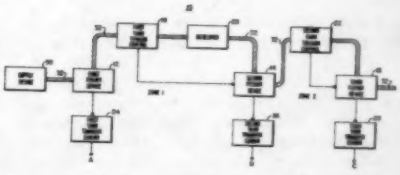
1. A process for determining the adhesion to glass of interlayers for laminated glass by the tensile shear test, which comprises subjecting to a tensile strain a substantially parallelepiped-like test specimen consisting of laminated glass, the individual sheets of glass of which are divided to form an obtuse fracture, the edges of the fractures facing the interlayer being staggered, and determining the minimum force required to detach the interlayer from the individual sheets of the glass laminate.

4,393,701

YARN TESTER SYSTEM

John B. Lawson, Providence, R.I., assignor to Lawson-Hemphill, Inc., Central Falls, R.I.

Filed Jan. 29, 1982, Ser. No. 344,066
Int. Cl.³ G01L *5/04*
U.S. Cl. 73—160 **32 Claims**



1. A yarn tester system comprising:

heater means for inducing a change in length of yarn to be tested;

first means for feeding yarn to be tested to said heater means at a first predetermined tension;

first means for sensing a function of the amount of yarn transferred by said first means for feeding;

second means for feeding yarn for receiving yarn from said heater means;

second means for sensing a function of the amount of yarn transferred by said second means for feeding;

third means for feeding yarn for receiving yarn from said second means for feeding;

third means for sensing a function of the amount of yarn transferred by said third means for sensing;

first yarn tension control means for establishing a second predetermined tension on said yarn between said first and second means for feeding and controlling the speed of said

second means for feeding to maintain said second predetermined tension;

second yarn tension control means for establishing a third predetermined tension on said yarn between said second and third means for feeding and controlling the speed of said third means for feeding to maintain said third predetermined tension; and

means, responsive to said first, second, and third means for sensing, for determining fiber shrinkage and recovery of the yarn which has been transferred between the first, second, and third means for feeding.

4,393,702

GAS FLOW MEASURING DEVICE

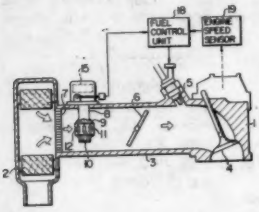
Tokio Kohama, Nishio; Hideki Obayashi, Okazaki; Hisasi Kawai, Toyohashi, and Tsuneyuki Egami, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 11, 1981, Ser. No. 242,563

Claims priority, application Japan, Mar. 21, 1980, 55-36614; May 14, 1980, 55-64427

Int. Cl.³ G01F 1/68

U.S. Cl. 73—204 9 Claims



1. A gas flow measuring device comprising:

pipe means for directing flow of a gas whose flow rate is to be measured;

an electric heater disposed within said pipe means;

a first temperature dependent resistor disposed within said pipe means downstream of said electric heater;

a second temperature dependent resistor disposed within said pipe means, at a position suffering substantially no influence of heat from said electric heater;

each of said first and second temperature dependent resistors and said electric heater includes a resistance wire of a platinum alloy;

wherein platinum is alloyed with a metal chosen from the group consisting of rhodium, iridium, palladium, ruthenium, and nickel;

a measuring circuit connected to said first and second temperature dependent resistors and to said electric heater to generate an output voltage indicative of the flow rate of the gas depending on the resistance values of said first and second temperature dependent resistors, said measuring circuit including at least two reference resistors constituting a bridge circuit together with said first and second temperature dependent resistors; and

each of said at least two reference resistors of said bridge circuit including a film resistor deposited on an insulating base.

4,393,703

SEALING ASSEMBLY FOR FURNACE PROBE BORE

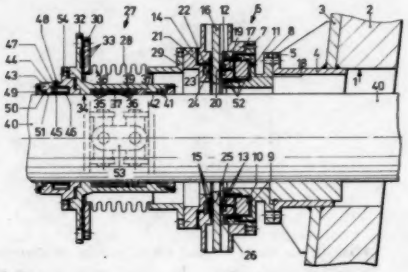
Werner Schneider, Siegen, Fed. Rep. of Germany, assignor to Dango & Dienenthal Maschinenbau GmbH, Siegen, Fed. Rep. of Germany

Filed Dec. 8, 1980, Ser. No. 213,917

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1979, 2950672

Int. Cl.³ G01N 1/22; G01D 21/02

U.S. Cl. 73—432 R 11 Claims



1. An attachment for a bore in the shaft wall of a blast furnace through which a blast furnace probe is received comprising, stop valve means, a sealing assembly, and a hose seal including an annular flexible element for slidably engaging said probe which bears against said blast furnace probe and which is connected to said sealing assembly.

4,393,704

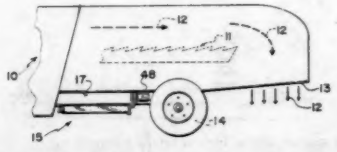
GRAIN LOSS SAMPLING DEVICE

Richard Bartko, R.R. #1, North Battleford, Saskatchewan, Canada (S9A 2X3)

Filed May 4, 1981, Ser. No. 259,836

Int. Cl.³ A01D 43/00; A01F 12/00

U.S. Cl. 73—432 R 15 Claims



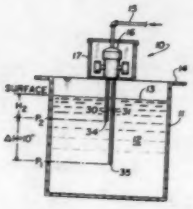
1. A grain loss sampling device for selectively sampling the discharge of a grain harvesting machine, said machine having a straw and chaff discharge across the rear thereof and a supporting framework extending forwardly therefrom; said sampling device comprising in combination a support frame pivotally securable by one end thereof in trailing relationship to said supporting framework of said grain harvesting machine upon the underside thereof and forwardly of said straw and chaff discharge, means to detachably support the other end of said support frame in a nonoperating position and to release said support frame to the operating position, and a drop box detachably held by said support frame, said drop box including sides and a base, said drop box being detachable from said support frame on to the ground therebelow and passing under said discharge when said support frame is in the operating position.

4,393,705

SPECIFIC GRAVITY LEVEL GAUGE AND METHOD

Charles D. Eidschun, Clearwater, Fla., assignor to Micro-Plate, Inc., Clearwater, Fla.

Filed Jul. 27, 1981, Ser. No. 287,246
Int. Cl.³ G01N 9/28
U.S. Cl. 73—439 5 Claims



1. A specific gravity and level gauge comprising, in combination,

a pair of pipes for insertion into a liquid fluid having a variable level and variable specific gravity, the length of the pipes being predetermined to provide a head differential between the lower end of the shorter pipe and the lower end of the longer pipe,

means for securing the pipes in essentially vertically oriented fashion with the liquid fluid to be measured,

means for supplying a gaseous fluid into each of the pipes including a plenum to maintain a given head of gaseous fluid by slowly discharging the gas into the liquid fluid at the lower end portion of the pipes,

a pair of gaseous fluid pressure chambers at the upper portion of the pipes,

bleed holes for permitting a gaseous fluid to pass from the plenum into the gaseous pressure fluid chambers and thence to the pipes,

and pressure transducer means for reacing the gaseous pressure fluid in the pressure chamber for the short pipe and the gaseous pressure fluid chamber for the long pipe.

4,393,706

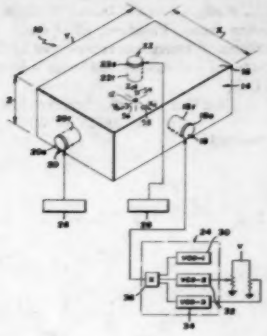
SYSTEM FOR CONTROLLED ACOUSTIC ROTATION OF OBJECTS

Martin B. Barmatz, Glendale, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 18, 1981, Ser. No. 303,672
Int. Cl.³ H02N 11/00
U.S. Cl. 73—505 11 Claims

1. Apparatus for levitating and controlling rotation of an object, comprising:

means for applying acoustic energy along at least two perpendicular directions to a region which includes the object, with the energy along a first direction including energy of first and second wavelengths, and with the energy along the second direction including energy of third and fourth wavelengths, the first and third wavelengths being different, and the second and fourth wavelengths being substantially the same and of lower intensity than the first and third wavelengths.

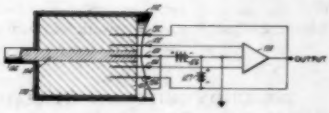


4,393,707

FLUIDIC ANGULAR RATE SENSOR EMPLOYING IONIZED GAS

Carl M. Ferrar, East Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 2, 1981, Ser. No. 308,321
Int. Cl.³ G01P 15/08
U.S. Cl. 73—505 2 Claims



1. A fluidic angular rate sensor comprising:

means for generating and directing a gas stream along an axis passing through a quantity of substantially stationary gas;

means for creating ions over a predetermined region of said gas stream and said stationary gas;

a center electrode positioned on said axis;

ion-collecting means comprising at least two ion-collecting electrodes for collecting ions from said gas stream at least two positions displaced symmetrically from said axis by a first predetermined transverse distance in a first plane passing through said axis, to form first and second ion currents;

a pair of compensating electrodes disposed symmetrically about said axis at a second predetermined transverse distance greater than said first predetermined transverse distance in said first plane, said pair of compensating electrodes being biased with respect to said center electrode by a bias amount such that ions are attracted from the vicinity of said ion-collecting electrodes toward said compensating electrodes, the amount of said bias being such that ion flow from said ion-collecting electrodes to said compensating electrodes is substantially equal to ion flow from said center electrode to said ion-collecting electrodes, whereby current flow common to both said ion currents is reduced;

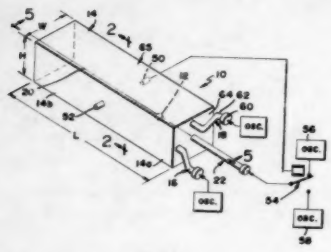
means for combining said first and second ion currents to form a signal representative of the difference between said ion currents.

4,393,708

ACOUSTIC SYSTEM FOR MATERIAL TRANSPORT

Martin B. Barmatz, Glendale; Eugene H. Trinh, Los Angeles; Taylor G. Wang, Glendale; Daniel D. Elleman, San Marino, and Nathan Jacobi, Pasadena, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 26, 1981, Ser. No. 314,929
Int. Cl.³ H02N 11/00
U.S. Cl. 73—505 9 Claims



1. A method for moving an acoustically positioned object within a chamber comprising:

applying acoustic energy of a plurality of resonant modes along the same predetermined direction within said chamber, in sequence, to move the object between pressure wells established by said modes, wherein a first mode has a first pressure well and a second mode has pressure wells on initial and final opposite sides of said first pressure well;

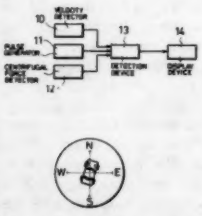
said step of applying acoustic energy including applying said first mode at a time when the object lies on said initial side of said first pressure well, to draw said object toward said first pressure well, and then applying said second mode while the object is moving toward said final side.

4,393,709

DIRECTION DETECTION APPARATUS

Masatoshi Harumatsu, Tamayama; Makoto Tomoyori, Iwate, and Noboru Tsushima, Morioka, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Nov. 12, 1981, Ser. No. 320,519
Claims priority, application Japan, Nov. 13, 1980, 55-159896
Int. Cl.³ G01C 19/58
U.S. Cl. 73—505 6 Claims



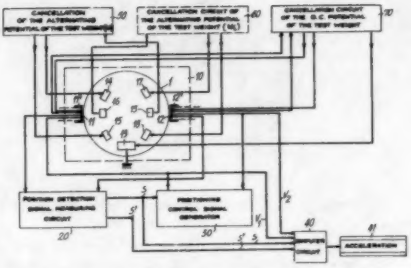
1. A direction detection apparatus comprising a centrifugal force detector including a weight and a detecting means for detecting a movement of said weight and generating a centrifugal force signal, a clock signal generator generating a time signal, a velocity detector generating a velocity signal, and a computation means connected to said force detector, clock signal generator and velocity generator to compute a directional angle on the basis of said centrifugal force signal, said time signal and said velocity signal.

4,393,710

ELECTROSTATIC ACCELEROMETER

Alain M. Bernard, Fresnes, France, assignor to Office National d'Etudes et de Recherches Aerospatiales, Chatillon, France

Filed Nov. 27, 1981, Ser. No. 325,590
Claims priority, application France, Nov. 28, 1980, 80 25272
Int. Cl.³ G01P 15/125, 15/13
U.S. Cl. 73—517 B 9 Claims



1. Electrostatic accelerometer comprising:

an electrically conducting test weight;

a cage in which said test weight is located;

a system of electrodes for suspending said test weight located in said cage at the points where the axes of a coordinate tri-rectangular trihedral meet the cage and associated by pairs of electrodes located along given coordinate axes of said trihedral, said electrodes forming with said conducting test weight pairs of variable capacitors, each pair relating to one coordinate axis;

a least a measurement circuit of the capacities of a pair of electrodes relating to one coordinate axis;

at least a generator of electrostatic positioning control signals of the test weight along said coordinate axis, driven by said measurement circuit and connected to the pair of electrodes relating to said coordinate axis;

means for calculating the gradients of the measured capacities of said pair of electrodes;

means for squaring said positioning control signals relating to said pair of electrodes; and

means for multiplying said gradient by said squared signals.

4,393,711

APPARATUS AND METHOD FOR ULTRASONIC DETECTION OF FLAWS IN POWER PLANT PIPING SYSTEMS

Melvin E. Lapides, Mountain View, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 13, 1980, Ser. No. 206,627
Int. Cl.³ G01N 29/04
U.S. Cl. 73—592 6 Claims

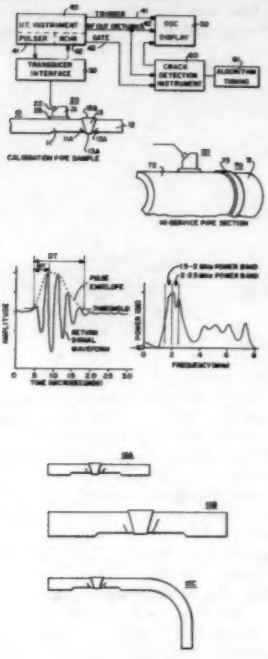
1. In a method of in-service ultrasonic detection of a cracking condition in a pipe section of predetermined configuration, the steps of:

(a) selecting a plurality of ultrasonic return signal features and a tunable algorithmic combination of the measured values thereof whose resultant value is useful in distinguishing return signals from a cracking condition and from geometric reflectors, said selection being based on prior ultrasonic examination studies on a plurality of pipe samples having a variety of known geometric reflectors and known cracking conditions;

(b) providing a calibration pipe sample having a prearranged configuration with geometric reflectors substantially corresponding to said pipe section and at least one known cracking condition;

(c) performing an ultrasonic examination of said calibration

pipe sample to measure the values of said selected return signal features while tuning said tunable algorithmic combination to optimize the capability of said algorithmic combination to distinguish return signals from said geometric reflectors and said known cracking condition;



(d) performing an ultrasonic examination of said pipe section using the same selected return signal features and said tuned algorithmic combination of the values thereof to ascertain the presence or absence of a cracking condition therein.

4,393,712

PORTABLE LIQUID CRYSTAL TESTING DEVICE

Jaswinder S. Sandhu, Chicago, Ill., assignor to Raj Technology Partnership, Chicago, Ill.

Filed Sep. 8, 1981, Ser. No. 300,003
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—603 **8 Claims**

1. A portable device for inspecting bodies for internal flaws and for providing a visual image thereof which comprises:

an ultrasonic transducer which emits ultrasonic energy for insonifying at least a portion of the body to be inspected;

a liquid crystal display for receiving energy from the insonified body and for visually displaying an image thereof; and

means for viewing the display;

wherein the improvement comprises said device being constructed to rest on a surface, to be acoustically coupled to said surface, and to inspect for flaws or features beneath said surface, said device including:

an assembly for separately but adjustably supporting said transducer and said liquid crystal display in reflection-receiving relation to each other, said assembly including:

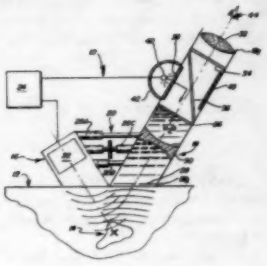
first housing means for supporting said transducer in relation to said surface;

second housing means for supporting said display in relation to said surface; and

interconnecting means for adjustably interconnecting said first housing means and said second housing means in reflection-receiving relation to each other,

said second housing means including:

an elongated hollow tube with one end constructed to contact said surface and the other end constructed for viewing, with the liquid crystal display being positioned intermediate the ends of the second housing means, there being further provided:



means at the viewing end for optically viewing images developed by said display;

means at the contacting end for acoustically coupling said second housing means to the surface; and

acoustic transmission means for contacting the cell and the coupling means for carrying acoustic signals from the contact end of said housing to the cell;

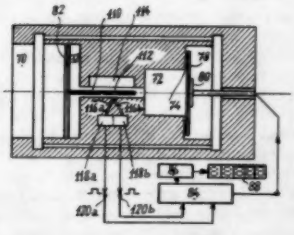
whereby when said device is placed on a surface, ultrasonic energy emitted from said transducer is projected into the body and reflections therefrom are received on said display through said coupling end and transmission medium for optical viewing.

4,393,713

DIGITAL PRESSURE-MEASURING DEVICE

Philippe Guillemot, Paris, France, assignor to Mecilec, Paris, France

Continuation-in-part of Ser. No. 52,980, Jun. 28, 1979, Pat. No. 4,301,685. This application Mar. 9, 1981, Ser. No. 241,743
Claims priority, application France, Jan. 27, 1980, 81 01450
Int. Cl.³ G01L *9/00*
U.S. Cl. 73—701 **7 Claims**



1. A digital pressure-measuring device comprising a first chamber subjected to the pressure to be measured, a second chamber connected to the first through an opening fitted with a valve, a pressure-tight partition-wall between the two chambers, said wall being deformable under the action of a pressure difference between the two chambers, an element for converting the deformation of the partition-wall directly to electrical

logic signals indicating the appearance of a pressure difference equal to a predetermined increment $+\Delta P$ and to a predetermined decrement $-\Delta P$ and to zero, wherein said element comprises an optical emitter, two light guides in spaced relation, two photoreceivers and a screen secured to the deformable wall and capable of displacement between the emitter and the light guides in order to permit or prevent penetration of the light into either of the two guides, said device being further provided with means for initiating opening of the valve under the action of the logic signals which indicate the appearance of a pressure difference equal to $+\Delta P$ and for initiating closure of said valve under the action of the signal which indicates that said difference is zero, bidirectional counting means for receiving said logic signals and accounting for the number of increments $+\Delta P$ obtained and reduced by the number of decrements $-\Delta P$ obtained.

4,393,714

DIFFERENTIAL PRESSURE SENSOR

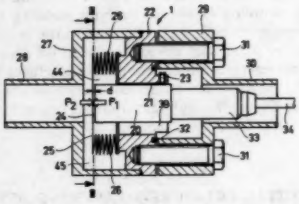
Curt Schmidt, Karlsruhe, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,692

Claims priority, application European Patent Off., Mar. 7, 1981, 81101676.5

Int. Cl.³ G01L 9/12

U.S. Cl. 73—718 **8 Claims**



1. A differential pressure sensor comprising in combination:
(a) a housing including means defining first and second inlets;
(b) a rod-shaped capacitive displacement sensor affixed to said housing in the interior thereof;
(c) a first electrode constituted by an end face of said displacement sensor;
(d) a second electrode constituted by a diaphragm extending generally parallel to and at a distance from said first electrode; said diaphragm having opposite faces;
(e) a bellows affixed to said housing and said diaphragm along a circumference thereof;
(f) a first chamber defined within said housing and communicating with said first inlet; and
(g) a second chamber defined within said housing and communicating with said second inlet; said first and second chambers being separated fluid tight from one another; one of said faces of said diaphragm being exposed to the pressure of a first fluid admitted to said first chamber through said first inlet and the other of said faces of said diaphragm being exposed to the pressure of a second fluid admitted to said second chamber through said second inlet, whereby said diaphragm is displaced and said distance from said first electrode is varied as a function of the difference between the pressures of said first and second fluids to vary the capacitance of said capacitive displacement sensor.

4,393,715

ABSOLUTE PRESSURE PICK-UP, ESPECIALLY FOR MEASURING PRESSURE AT INTAKE IN INTERNAL COMBUSTION ENGINES

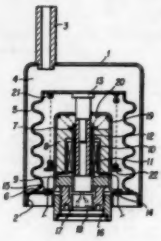
Claude Lombard, Le Chesnay, France, assignor to Regie Nationale Des Usines Renault, Boulogne-Billancourt, France

Filed Apr. 23, 1981, Ser. No. 256,975

Claims priority, application France, May 7, 1980, 80 10172

Int. Cl.³ G01L 9/10

U.S. Cl. 73—728 **3 Claims**



1. A pressure pick-up comprising:
a sealable rigid cylindrical envelope having two ends;
a fluid tight elastic bellows in said envelope and having one end attached to one of said ends of said envelope;
biasing means associated with said bellows for expanding said bellows;
a ferrite screened magnetic circuit in said bellows;
a mobile ferrite core in said circuit and fixed to the other end of said bellows;
a single induction coil within said circuit, said coil having two ends extending out of said envelope;
means for applying a fluid pressure in said envelope and only on the outside of said bellows; and
means for providing a fluid tight seal for said envelope at points where said two ends exit said envelope.

4,393,716

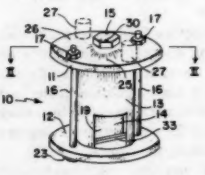
FIXTURE FOR ENVIRONMENTAL EXPOSURE OF STRUCTURAL MATERIALS UNDER COMPRESSION LOAD

Ronald K. Clark, Hampton, and W. Barry Lisagor, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 26, 1980, Ser. No. 210,506

Int. Cl.³ G01N 3/08, 3/02, 25/00

U.S. Cl. 73—818 **3 Claims**



1. An apparatus for stressing deformable materials which comprises:
a top plate;
a bottom plate;
A guide cylinder positioned between said top plate and said bottom plate;
a load piston positioned within said guide cylinder;

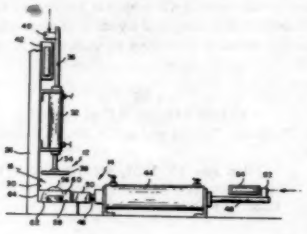
an adjustable loading bolt positioned in the center and extending through said top plate to contact said load piston;
means for positioning a deformable material specimen between said bottom plate and said load piston;
said adjustable loading bolt serving to apply a compression load force to said load piston;
means for maintaining the compression load force on said load piston, said means for maintaining the compression load force consisting of two tie bolts;
each said tie bolt extending from the upper surface of said top plate to the lower surface of said bottom plate;
said tie bolts being fixably attached to said bottom plate; and
each of said tie bolts extending through a tie bolt nut positioned on the upper surface of said top plate;
whereby tightening said tie bolt nuts draws said top plate toward said bottom plate, and pushes said top plate and said bottom plate securely against said guide cylinder to thereby maintain the compression load force applied to the specimen by said loading bolt and said load piston.

4,393,717

APPARATUS FOR TESTING MEDICINAL TABLETS

Donald L. Mason, Washington, and Warren A. McAllister, Greenville, both of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jan. 6, 1981, Ser. No. 222,825
Int. Cl.³ G01N *3/08*
U.S. Cl. 73—821 **16 Claims**



1. Apparatus for testing medicinal tablets for thickness, diameter and hardness comprising a support for receiving tablets one at a time for testing, means movable relative to the support in a direction perpendicular to the thickness of the tablet to measure the thickness of the tablet, means movable relative to the support in a direction at right angles to the thickness of the tablet to measure the diameter of the tablet, said latter means being further movable to crush the tablet to thus measure the hardness, and means for effecting reciprocal movement of the aforesaid means in sequence and for repeating said sequence of operation for a predetermined number of tablets.

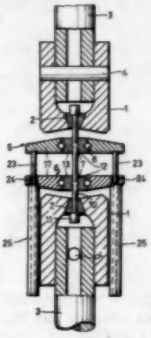
4,393,718

ASSEMBLY FOR STRESS TESTING MATERIAL UNDER HIGH TEMPERATURES

Werner Gebhard, Forsbach, and Claus Kroder, Cologne, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs-und Versuchsanstalt für Luft-und Raumfahrt e.V., Fed. Rep. of Germany

Filed Jun. 17, 1981, Ser. No. 274,573
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023063
Int. Cl.³ G01N *3/04*
U.S. Cl. 73—859 **5 Claims**

1. An assembly for tensile stress testing material under high temperatures, said assembly comprising:
(a) two clamping means mounted to move longitudinally with respect to each other and having a structural configuration to hold a workpiece at two laterally displaced locations thereon,
(b) each clamping means includes a clamping head and a divided workpiece end holder disposed within the clamping head,
(c) the clamping heads each have a front wall facing each other and an inwardly enlarged opening at their facing front walls,
(d) each divided workpiece end holder is mounted in said enlarged opening and contains a longitudinal opening for the passage of the end of the workpiece,
(e) the rear side of each workpiece end holder having a support face effective to support a thicker head located at the end of the workpiece, and



(f) a measuring apparatus including two laterally displaced elongation measurement holders for engaging the workpiece at two laterally displaced locations thereon which locations are inwardly spaced from the ends of the workpiece,
(g) said measurement holders include an annular jacket ring having a central opening and a bipartite inner annular ring mounted within said central opening,
(h) each of the sections of said bipartite inner ring having an annular groove facing inwardly with respect to the specimen and having a structural configuration to engage a shoulder formed at each of the two laterally spaced locations on the workpiece.

4,393,719

IONIZATION FLOWMETER

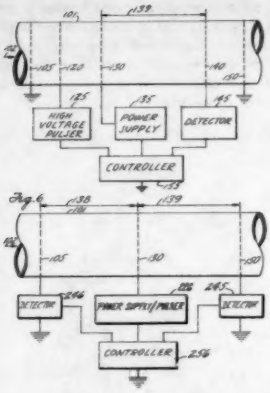
Walter J. Wiegand, Glastonbury, and Robert H. Bullis, Avon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 20, 1981, Ser. No. 284,837
Int. Cl.³ G01F *1/70*
U.S. Cl. 73—861.05 **25 Claims**

12. An apparatus for measuring the flux of a fluid flowing along an axis through a defined region comprising:
(a) ion means for producing a concentration of ions distributed in said fluid and for varying said ion concentration to produce ion concentration changes in said fluid;
(b) a plurality of planar fluid-permeable electrodes oriented substantially perpendicular to said fluid flow and disposed along the axis of said flow region at predetermined positions;
(c) voltage means for applying a first potential between said ion producing means and a first fluid-permeable electrode disposed on a first side of said ion producing means;
(d) voltage means for applying a second potential between said first electrode and a second fluid-permeable electrode located on said first side further from said ion producing means than said first fluid-permeable electrode;
(e) first signal means for generating an entrance signal re-

lated in time to the passage of ion concentration changes through said first fluid-permeable electrode and first detection means for generating an exit signal related in time to the passage of ion concentration changes through said second fluid-permeable electrode; and

(f) combining means, responsive to said first signal means and first detection means, for combining first entrance and



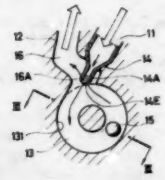
exit signals obtained at a first value of said second potential with second entrance and exit signals obtained at a second value of said second potential with a representation of the magnitudes of said first and second voltages and with other physical parameters of the apparatus in a predetermined manner to form a representation of the fluid flux.

4,393,720

BALL-CIRCULATION TYPE LIQUID FLOW RATE SENSOR

Toru Takahashi, Mito, and Sadayasu Ueno, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 24, 1981, Ser. No. 305,387
Claims priority, application Japan, Sep. 24, 1980, 55-131634
Int. Cl.³ G01F 1/70
U.S. Cl. 73—861.05 **16 Claims**



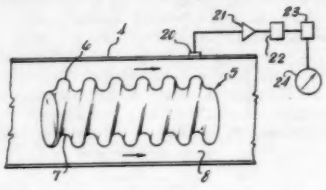
1. A flow rate sensor comprising an annular passage means for enabling a flow of liquid therethrough, a movable member disposed in the annular passage means, an intake passage means for supplying the liquid to the annular passage means, and an outlet passage means disposed concentrically to the intake passage means for enabling the liquid to flow out of the annular passage means about an outer periphery of the intake passage means.

4,393,721

APPARATUS FOR MEASURING FLUID FLOW

John T. Turner, Higher Disley; Harish C. Gulati, Denton; William B. Hall, Alderley Edge, all of England, and Arnold Watson, Auckland, New Zealand, assignors to The Victoria University of Manchester, Manchester, England

Filed Aug. 17, 1981, Ser. No. 293,344
Claims priority, application United Kingdom, Aug. 16, 1980, 8026746
Int. Cl.³ G01F 1/20
U.S. Cl. 73—861.21 **16 Claims**



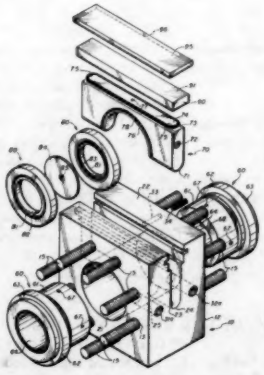
1. Apparatus for measuring fluid flow comprising a tubular body, means defining a fluid flow path, a member within said tubular body formed of crest and trough formations disposed along said path such that the flow of fluid is between the outer surface of said member and the internal surface of said tubular body and produces a signal which is dependant upon the fluid flow, means for detecting said signal, and means for converting the detected signal to provide a measurement of the fluid flow.

4,393,722

FLOW MEASURING DEVICE

Marvin D. Scott, 701 Morningside Dr., Mineral Wells, Tex. 76067

Filed Jun. 15, 1981, Ser. No. 273,741
Int. Cl.³ G01F 1/42
U.S. Cl. 73—861.61 **6 Claims**



1. A fluid measuring device comprising:

housing having a bore therethrough; a pair of spaced fluid passageway means in said housing for permitting fluid to exit said housing for differential pressure measurement; and

removable orifice means removably insertable substantially across said housing bore intermediate said pair of passageway means, said orifice means comprising,

a carrier member having a central arcuate cutout portion of slightly greater than 180 degrees, an orifice plate and centrally apertured seal plates on opposite sides of said

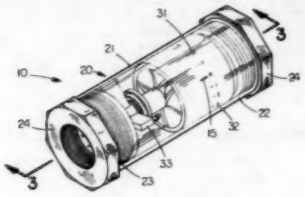
orifice plates, all of said plates being carried within said carrier cutout portion whereby said plates are restrained from radial movement.

4,393,723

FLUID FLOW METER

Glen Brand, 4114 N. 79th, Omaha, Douglas County, Nebr. 68134

Filed Apr. 16, 1981, Ser. No. 254,675
Int. Cl.³ G01F 1/11
U.S. Cl. 73—861.72 10 Claims



1. A fluid flow meter, comprising:

a turbine having a hub for mounting on a supporting structure affixed to the interior of a housing having inlet and outlet ends, for both rotational and downstream movement of said turbine with respect to said supporting structure, in response to the rate of flow of fluid through said housing;

means for biasing said turbine with forces in directions opposite to those applied to said turbine by said fluid flow; and

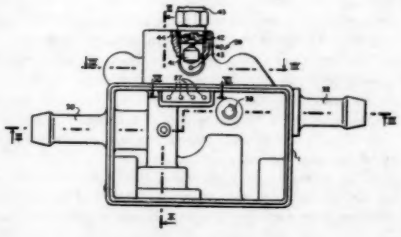
means for determining the combined rotational and downstream displacement of said turbine, whereby said flow rate can be translated to more than 360° of angular displacement of said turbine.

4,393,724

FLOW METER HAVING A ROTARY BODY

Karl-Heinz Werkmann, and Wolfgang Sauerschell, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 273,146
Int. Cl.³ G01F 1/10
U.S. Cl. 73—861.91 41 Claims



1. In a flow meter, particularly for liquids, having an impeller which is arranged in a measurement bore and is drivable by a flow stream of oncoming flow flowing through the measurement bore, the improvement comprising

a housing forming a chamber with an inlet connection and an outlet connection,

a movable wall subdividing said chamber into two chamber halves,

one of said chamber halves is in communication with said inlet connection and the measurement bore upstream of said impeller,

the other of said chamber halves is in communication with said outlet connection and the measurement bore downstream of said impeller,

the impeller has a bearing shaft, the ends of said bearing shaft being rotatably mounted in an axially and radially guiding bearing,

at least one vane of the impeller having a flow-on surface inclined to the direction of the oncoming flow, and

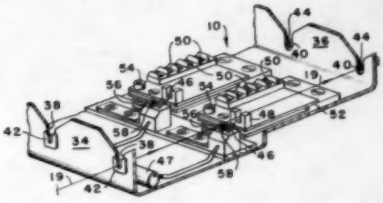
sensor means for detecting the rotary frequency of said impeller.

4,393,725

APPARATUS TO MEASURE YARN TENSION

Larry S. Satterfield, Moore, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 23, 1981, Ser. No. 236,966
Int. Cl.³ G01L 5/10; G01H 13/00
U.S. Cl. 73—862.41 4 Claims



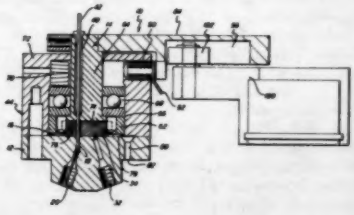
3. Apparatus to measure the tension in a running length of yarn comprising: a frame, at least one pair of guide members attached to said frame and longitudinally spaced from one another to guide yarn from one end of said frame to the other end of said frame, air jet means mounted to said frame to supply air under pressure against the yarn passing between said guide members to cause said yarn to vibrate at its harmonic frequency and a second means mounted in said frame to measure the harmonic frequency of the yarn as it passes through said guide members.

4,393,726

SAMPLING VALVE USEFUL IN LIQUID CHROMATOGRAPHY

Rolf Tamm, Salem, and Toma Tomoff, Uberlingen, both of Fed. Rep. of Germany, assignors to Bodenseeverk Perkin-Elmer & Co. GmbH, Fed. Rep. of Germany

Filed Sep. 23, 1981, Ser. No. 304,735
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1980, 3037014
Int. Cl.³ G01N 35/00
U.S. Cl. 73—864.84 3 Claims



1. Method of feeding samples in liquid chromatography, said method comprises the steps of:

providing a sample into a dosing loop by means of an injec-

tion needle through a sample inlet valve said valve having stationary and movable members in a first position of said valve,

changing said sample valve to a second position, thereby connecting, in series, a transport liquid source, said dosing loop and a separating column, and

wherein said providing step includes:

sucking an air volume into said injection needle prior to sucking-in said sample;

inserting said injection needle, through a bore in said movable valve member into a dosing bore of said stationary valve member,

retracting said injection needle after the sample has been introduced and prior to said changing-over of said sample valve.

4,393,727

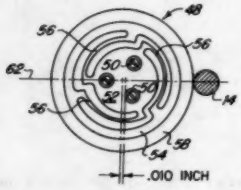
FRICTION DRIVE

Edward H. Phillips, Middletown, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.

Filed Mar. 11, 1980, Ser. No. 129,214

Int. Cl.³ F16H *13/14*

U.S. Cl. 74—209 **10 Claims**



1. A friction drive comprising:

a rotary drive member;

a rotary driven member; and

a compliant rotary member for coupling the rotary drive member and the rotary driven member together, the compliant rotary member being loaded against at least one of those members;

the compliant rotary member having a circular inner portion and an annular outer portion resiliently and eccentrically offset relative to one another and further having at least three circumferentially extending spring elements symmetrically disposed around the periphery of the inner portion, each of those circumferentially extending spring elements being entirely circumferential in an unloaded condition of the compliant rotary member, being rigidly attached at one end to the inner portion and being rigidly attached at another end to the outer portion.

4,393,728

FLEXIBLE ARM, PARTICULARLY A ROBOT ARM

Ove Larson, Gothenburg, and Charles Davidson, Askim, both of Sweden, assignors to Robotgruppen HB, Gothenburg, Sweden

Continuation of Ser. No. 129,202, Mar. 11, 1980, abandoned. This application Feb. 23, 1982, Ser. No. 351,589

Claims priority, application Sweden, Mar. 16, 1979, 7902366

Int. Cl.³ B25J *1/02*; F16C *1/00*; A61F *1/06*

U.S. Cl. 74—469 **14 Claims**

1. A flexible arm, particularly a robot arm, for supporting and/or manipulating tools or the like, wherein a number of elements are arranged in series for contacting each other and power-generating and power-transmitting actuating means are provided and arranged to operate the elements to move them with respect to each other comprising each said element has segments with convexly curved surfaces substantially oppositely disposed with respect to each other, the curved surfaces of each of said segments engaging the adjacent curved surfaces of the adjacent segments so that said elements have a rolling motion in relation to each other when actuated by said actuating means, the radius of curvature of said curved surfaces

being relatively considerably larger than the height of said segments.

4,393,729

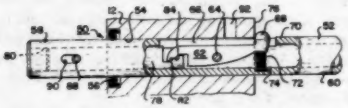
GEAR SHIFT MECHANISM

Thomas E. Wilson, Troy, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1981, Ser. No. 238,286

Int. Cl.³ G05G *5/24*

U.S. Cl. 74—475 **4 Claims**



1. A gear shift mechanism for a gear mounted on a shaft within the housing of a power transmitting device comprising:

a shift rod mounted parallel with said shaft and capable of axial movement between a first and a second position, said shift rod extending through a hole in said housing to have an external end and an internal portion;

coupling means rigidly mounted on said internal portion coupling said shift rod to said gear to cause said gear to be capable of moving in response to said movement of said shift rod;

a locking lever pivotally mounted within a slot in said shift rod and having an extended end thereof capable of extending beyond an external surface of said shift rod;

said locking lever being pivotally biased to cause said extended end to overlie said housing adjacent said hole when said shift rod is in said first position and to make sliding contact with an interior surface of said hole when said shift rod is in said second position and between said first and said second positions; and

means for retracting said extended end of said locking lever to be within said slot when said shift rod is selectively moved from said first position to said second position.

4,393,730

UNIDIRECTIONAL DETENT GATE

John R. Randall, La Palma, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 24, 1980, Ser. No. 209,733

Int. Cl.³ G05G *5/06*

U.S. Cl. 74—538 **10 Claims**

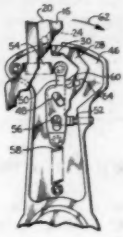
10. A unidirectional gate for a detent slot on the periphery of a base activated by a roller moving in a first plane comprising:

a first pivot peg mounted on said base member perpendicular to said first plane;

a carrier mounted on said first pivot peg for rotation in a first direction in a second plane parallel to said first plane;

spring means attached to said base and said carrier restraining rotation of said carrier in a first direction, said carrier rotation in the second direction opposite said first direction limited by a stop located on said base member;

second pivot peg mounted on said carrier perpendicular to said first plane and parallel to said first pivot peg;



a cover having two slots therein mounted on said first and second pivot pegs for rotation and for vertical movement;

second spring means attached to said cover and to said base to restrain rotation and vertical movement of said cover; and

a pin mounted on said cover, perpendicular to said first plane, to engage said roller in a first arc to move said cover and expose said detent slot, and when said roller engages the said pin in a second arc opposite said first arc, the roller forces the gate closed, providing a bridge over the detent slot.

4,393,731

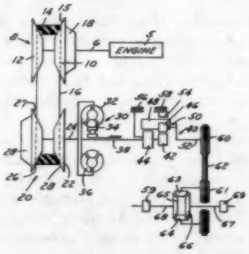
INFINITELY VARIABLE BELT-DRIVE TRANSMISSION

Howard L. Croswhite; Po-Lung Liang, both of Livonia, and Alan R. Fisher, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 15, 1980, Ser. No. 186,944

Int. Cl.³ F16H *37/08, 57/10, 47/08*

U.S. Cl. 74—689 **10 Claims**



1. A motor vehicle transmission for producing a stepless range of torque ratios between an input member and an output member comprising:

means connected to the input member for varying its torque ratio by steplessly changing the radial distance from the axes of the input member and its output member at which an endless, flexible belt driveably engages these members;

a hydrodynamic torque converter connected to the output of the torque ratio producing means, adapted to multiply the torque output of the torque ratio producing means over at least a portion of its range; and

a gearset connected to the output of the torque converter adapted to selectively produce forward drive or reverse drive at a constant torque multiplication.

4,393,732

ABNORMALITY TREATMENT DEVICE FOR AUTOMATIC TRANSMISSION CONTROL DEVICE

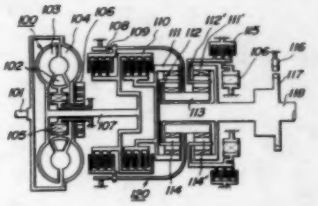
Tadashi Suzuki, and Norimasa Kishi, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

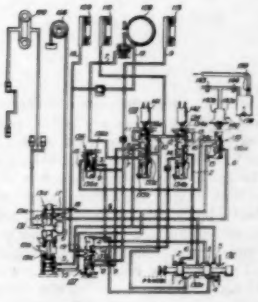
Filed Sep. 23, 1980, Ser. No. 190,071

Claims priority, application Japan, Sep. 28, 1979, 54-124816; Sep. 28, 1979, 54-124817; Sep. 28, 1979, 54-124818; Sep. 28, 1979, 54-124819

Int. Cl.³ B60K *41/16;* **F16H** *5/64*

U.S. Cl. 74—866 **9 Claims**





1. An abnormality treatment device for a control device for an automatic transmission including a speed change gear mechanism whose power transmission passage is connected to an output shaft of an engine and changed by means of hydraulically operated friction means to obtain a plurality of speed ranges, said treatment device including a speed range selection judgement circuit for receiving respective signals from an engine load sensor generating engine load signals corresponding to engine loads and from a vehicle speed sensor generating vehicle speed signals corresponding to vehicle speeds, comparing these signals with values corresponding to predetermined engine load and vehicle speed and determining said speed range and operation of said friction means, and a hydraulic control judgement circuit for receiving the signals from said engine load sensor to operate a hydraulic regulator valve, said treatment device comprising, in its input portion receiving the signals from said engine load sensor and said vehicle speed sensor, an abnormal value detection circuit for detecting an abnormal value of any one of said respective signals to generate an abnormal value detection signal, and an abnormality treatment circuit for producing abnormality treatment signals to be fed to said speed range selection judgement circuit and said hydraulic control judgement circuit in response to said abnormal value detection signal, thereby upon detection of the

abnormal value signal, enabling said speed range selection judgement circuit and said hydraulic control judgement circuit to maintain a predetermined speed range and a predetermined high pressure, respectively.

4,393,733

CORKSCREWS WITH TACKLE REDUCTION

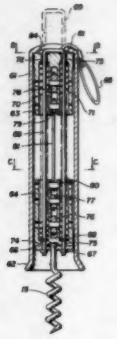
Bruno Desnoulez, 76, Boulevard du General Koenig, 92200 Neuilly, and Andre Dejoux, 15, rue Lakanal, 75015 Paris, both of France

Filed Aug. 1, 1980, Ser. No. 174,655

Claims priority, application France, Aug. 2, 1979, 79 19823; Jul. 4, 1980, 80 14994

Int. Cl.³ B67B *7/00*

U.S. Cl. 81—3.38 A 7 Claims



1. A corkscrew comprising a screw-carrying plate and a tackle arrangement, a one-piece molded generally tubular body, a cork extracting screw fixed to said screw-carrying plate, means to mount said plate and said tackle arrangement inside said body, said body being closed by an end wall at its other upper end, said tackle arrangement comprising upper and lower tackle block means to secure said upper tackle block in said upper end of said body in closely spaced relation to said end wall, said securing means comprising a pin extending through said upper tackle block and the juxtapositioned portions of said body, said one-piece molded body being formed with integral internal groove means extending over substantially all of the internal height of said body, said upper and lower tackle blocks and screw-carrying plate being formed with complementary groove means mating with said body groove means, mating of said body and upper tackle block groove means serving to prevent relative rotation between said upper tackle block and said body, mating of said lower tackle block and said body groove means serving to prevent relative rotation between said lower tackle block and said body and to guide axial motion of said lower tackle block within said body, said upper tackle block serving as a stop for the upward motion of said lower tackle block within said body, a generally "U"-shaped stirrup comprising a pair of generally parallel elongated legs and a cross-connecting portion at one end of said legs, said body end wall being formed with an opening to permit said cross-connecting portion of said stirrup and portions of said legs to extend therethrough and to be located externally of said body, said stirrup cross-connecting portion being adapted to fit through said end wall opening and to engage an upper surface of said upper tackle block to thereby define an end of downward travel stop of said stirrup with respect to said upper tackle block, recall compression spring means mounted on said legs of said stirrup and constrained between said upper and lower tackle blocks to normally urge said upper and lower tackle blocks away from each other; means to secure said screw-carrying plate, said lower tackle block and the free ends of said legs of said stirrup to each other; said securing means comprising a pair of crimped portions on each of said legs which fix said lower tackle block and said screw-carrying plate therebetween, said tackle arrangement comprising cable means, means to secure one end of said cable means to said lower tackle block, said one-piece generally tubular body end wall being formed with opening means permitting said cable means to pass therethrough, the end of said cable means passing through said opening means comprising a free operating end of said tackle arrangement cable means, said molded one-piece tubular body including no external moving parts other than said free operating end of said cable means, and said stirrup legs' length being such with respect to said upper and lower motion stops and with respect to the length of said one-piece molded generally tubular body that said screw-carrying plate and said lower tackle block secured thereto do not extend out of the lower open end of said body during normal use of said corkscrew.

4,393,734

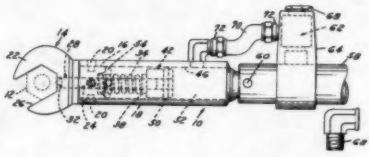
COMBINED TORQUE LIMITING AND MARKING WRENCH

M. W. Thorn; E. R. Thorn, both of Farmington Hills, and Brent Thorn, Northville, all of Mich., assignors to Van F. Belknap Co., Inc., Wixom, Mich.

Filed May 28, 1981, Ser. No. 267,836

Int. Cl.³ B25B *23/00*

U.S. Cl. 81—468 2 Claims



1. A torque limiting and part marking wrench comprising an elongated tubular torque applying handle, an elongated generally cylindrical housing pivotally mounted at one end to said torque applying handle, a replaceable part engaging head assembly mounted to the other end of said housing, and a part marking mechanism mounted within said housing, said torque applying handle, cylindrical housing, head assembly and part marking mechanism being disposed along a common axis, means for releasably mounting said head assembly to said housing whereby said head assembly may be replaced with another head assembly of a different size or design, and said housing being positionable at various attitudes relative to said torque applying handle depending on the location of a part operated upon by the wrench and the available working space;

said head assembly including a wrench head portion having an open part engaging area and a generally cylindrical shank portion that is releasably retained within said other end of said housing by said mounting means;

said marking mechanism including a striking pin that passes through a bore in said head assembly shank portion for reciprocal movement, said striking pin being mounted to a piston assembly that is slidably movable within a bore in said housing, said striking pin being extended outwardly from said housing for marking a part in response to fluid pressure acting on said piston assembly and said striking pin being retracted within said housing by a return spring mounted between said head assembly shank portion and said piston assembly;

said housing including a fluid receiving chamber for receiving pressurized fluid from an on-off fluid valve unit mounted on said torque applying handle, said piston assembly being actuated in response to fluid pressure in said chamber from said valve unit when the torque on a part acted upon by said wrench has reached a predetermined value due to manipulation of said wrench.

4,393,735

CUTTING PLATE CARRIER INSERTABLE IN A HOLDER OF A MACHINE TOOL, IN PARTICULAR A LATHE TOOL

Otto Eckle, Loechgau, and Helmut Veigel, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH, Besigheim, Fed. Rep. of Germany

Filed Nov. 14, 1980, Ser. No. 206,775

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1980, 8000947[U]

The portion of the term of this patent subsequent to Jan. 3, 1995, has been disclaimed.

Int. Cl.³ B23B *27/00, 29/00*

U.S. Cl. 82—36 R **6 Claims**

1. In a cutting plate carrier insertable in a holder of a machine tool, in particular a lathe tool, said cutting plate carrier having a plane base surface and a cylindrical peripheral surface adjacent and extending perpendicularly thereto and the axis of which coincides with the axis of a central screw thread provided in said cutting plate carrier and extending perpendicularly to the base surface, a recess for a polygonal cutting plate having plural cutting tips, plural lateral surfaces and a central bore therein and fixable in said recess by means of a clamping screw which can be screwed into said central thread, for which cutting plate said recess has a plane supporting surface arranged parallel to said base surface and a plurality of bearing surfaces extending parallel to said lateral surfaces of said cutting plate, and a second screw thread provided parallel to said central screw thread and for screwing in a retaining screw inserted into said holder from a side thereof remote from said recess, the improvement comprising wherein said cutting plate carrier has a substantially circular plan, the axis of which coincides with the axis of said central screw thread, wherein the number of said plurality of bearing surfaces corresponds to the number of said plural lateral surfaces on said cutting plate, said bearing surfaces each being arranged at an equal distance (a) from said central screw thread, and wherein the radius of said peripheral surface of said cutting plate carrier is only slightly greater than the distance of said cutting tips of said cutting plate from its said central bore, whereby said cutting tips are wholly radially inside said peripheral surface and in said recess to thereby render said cutting plate unusable until undesired portions of said cutting plate carrier are removed to expose a desired amount of said cutting plate.

4,393,736

CUTTER FOR A MOVING STRAND

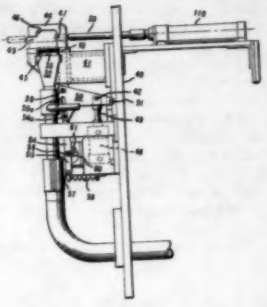
Thomas R. Clark, Wilmington, Del.; Alvin E. Lillmars, Newtown Square, Pa.; Elwood A. Roth, Seaford; Alvin L. Schmick, Frederica, both of Del., and Maurice C. Todd, Chadds Ford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 10, 1981, Ser. No. 252,720

Int. Cl.³ B65H *35/00*

U.S. Cl. 83—100 **2 Claims**

1. In an apparatus for processing at least one continuous advancing strand, a cutting device for the strand comprising: a support situated adjacent the path of travel of the strand; a bed knife attached to said support and located below and across said path of travel; an arm positioned above the path of the strand for movement across the strand path to engagement with said bed knife; a linkage mechanism having a knee and being pivotally connected at one end to said support while the other end of the linkage mounts said arm for said movement; a first motive means coupled to said linkage for imparting said movement; a second motive means engageable with the knee of the linkage to hold the knee in an over-the-center position and limit movement of said arm to a location slightly above the



strand path and then when energized, said second motive means moves the knee over center and allows said arm to complete its movement to engagement with said bed knife; means for removing the severed and continuously advancing strand located adjacent said bed knife; and a longitudinal member and mounting means between said longitudinal member and said support to allow transverse movement across the strand path above the strand removal means.

4,393,737

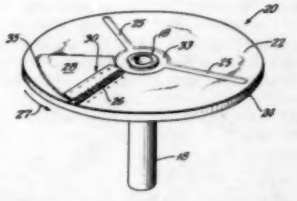
JULIENNE CUTTER FOR FOOD PROCESSORS

Koichiro Shibata, Seto, Japan, assignor to Cuisinarts, Inc., Greenwich, Conn.

Filed Feb. 5, 1981, Ser. No. 231,592

Int. Cl.³ B26D *3/26*

U.S. Cl. 83—356.3 **5 Claims**



1. A julienne cutter tool for use in rotary food processors of the type having a working bowl with tool drive means extending into the bowl for rotating said julienne tool in said bowl in a predetermined direction about an axis, a removable cover for the bowl when in use, and a feed passage for introducing food material into the bowl, said julienne tool having a hub with a disc-like member secured to the hub, said disc-like member having a periphery and an elongated opening therein extending from a region near said hub to a region near the periphery of said disc-like member, said disc-like member having an elevated portion having a leading edge located behind said opening, and cutting means associated with said opening for producing multiple closely spaced cuts in food items applied thereto with the resultant cut strips passing through said opening into said bowl, said julienne cutting tool comprising:

a unitary integral cutting structure formed of sheet metal having an elongated lower portion integral with an elon-

gated upper portion, which is at a higher elevation than said lower portion,

said elongated lower portion of said integral cutting structure being secured beneath said disc-like member in front of said opening in said disc-like member,

said elongated upper portion of said integral cutting structure being secured to the top of said elevated portion of said disc-like member behind said opening near to the leading edge of said elevated portion of said disc-like member,

said elongated upper portion of said cutting structure projecting forward generally horizontally beyond the leading edge of said elevated portion of the disc-like member,

said cutting structure including a row of relatively closely spaced, small parallel blades integral with both said upper and lower portions of said cutting structure,

said row of blades being located in said elongated opening,

said small, parallel blades extending upwardly relative to said disc-like member as seen looking at said row of blades in front elevation,

each of said blades being integrally joined to said upper portion of the cutting structure by an upper triangular gusset,

each of said blades being integrally joined to said lower portion of the cutting structure by a lower triangular gusset,

said upper and lower triangular gussets extending generally horizontally in opposite directions from the respective blades,

the leading edges of the upper triangular gussets being sharpened for forming a series of horizontally aligned knife edges,

the leading edges of the blades also being sharpened,

for said upper triangular gussets to make clean horizontal cuts in food items and for said blades to make uniformly spaced upright cuts in the food items for forming cleanly, uniformly, and neatly cut julienne strips when said cutter tool is rotated at high speed by the drive means in the food processor.

4,393,738

CUTTING ROLL FOR PRODUCING SHAPED INNER AND OUTER CUTS AND A METHOD FOR MAKING SAME

Günter Heyden, Neuwied, Fed. Rep. of Germany, assignor to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Continuation of Ser. No. 123,634, Feb. 22, 1980, abandoned. This application Sep. 24, 1981, Ser. No. 305,143

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1979, 2907325

Int. Cl.³ B26D *1/62*; B21K *5/12*

U.S. Cl. 83—663 **2 Claims**

1. A method of making a cutting roll for producing shaped inner and outer cuts on moving webs or discrete blanks of paper or the like, comprising the steps of:

welding a multiplicity of weld beads made of a highly wear-resistant steel alloy on a base member made of a readily weldable steel so as to form a web-like blade whose cutting edge corresponds to the contour of the desired cutting pattern, said weld beads being disposed one above the other and one beside the other longitudinally along and on said base member, said weld beads being arranged and disposed to substantially assume the desired blade profile with a cutting edge having a rounded cross-sectional profile supported on a narrower neck portion so as to require only minor machining to form the cutting edge of the blade; and

sharpening in a single machining operation the cutting edge of said blade to a shape resembling a pitched roof.

4,393,739

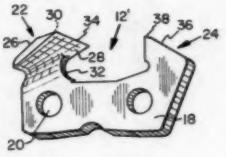
TOP SHARPENING CHAIN

Jaroslav J. Olmr, Columbia, S.C., assignor to Textron, Inc., Providence, R.I.

Filed Mar. 25, 1981, Ser. No. 247,237

Int. Cl.³ B27B *33/14*

U.S. Cl. 83—834 **5 Claims**



1. In a top sharpening saw chain cutting link formed of a single piece and sharpenable by a grinding device attached to a chain saw and including a body portion, a depth gauge and an integral hooded cutting element, the improvement comprising a side plateless cutting element including a top plate having a bottom surface, a top surface spaced therefrom and initiating rearward thereof at a leading end, and a leading end connecting surface extending between the top surface and bottom surface, a juncture between the connecting surface and the bottom surface defining the only cutting edge of the cutting element, said top plate connecting to said body portion through a surface located rearward of said juncture and along a side of said bottom surface so as to define an area of clearance for chip passage.

4,393,740

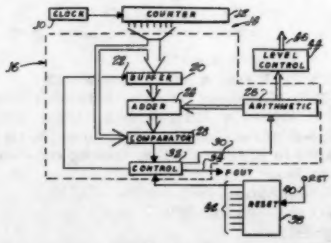
PROGRAMMABLE TONE GENERATOR

Thomas A. Niezgoda, DeKalb, and Carl P. Oppenheimer, Sycamore, both of Ill., assignors to The Wurlitzer Company, DeKalb, Ill.

Continuation of Ser. No. 22,970, Mar. 23, 1979, abandoned. This application Jan. 2, 1981, Ser. No. 221,983

Int. Cl.³ G10H *1/00*

U.S. Cl. 84—1.01 **8 Claims**



1. A digital electronic tone signal generating circuit for an electronic musical instrument comprising: a clock, digital counter means having an input connected to said clock and having a plurality of outputs, a plurality of like tone signal

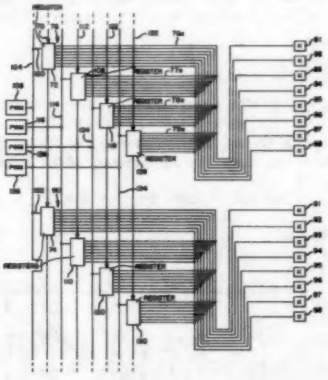
branches each comprising a digital signal processing circuit including buffer means connected to selected ones of said counter outputs, adder means connected to said buffer, programmable variable number source means connected to said adder, comparator means connected to said adder and also to said selected counter outputs, and flip-flop means connected to said comparator and controlled thereby to produce either a logic 1 or logic 0 output, said selected counter outputs and said programmable variable number source means cooperating for controlling the state of said flip-flop means to construct a rectangular wave output of selected pulse width and pulse spacing in each tone signal branch, thereby comprising a composite tone signal of selected fundamental frequency and harmonic content for each tone signal branch, wherein said programmable variable number source means comprises means providing programmed fixed numbers, programmable means for generating further numbers and means for selectively adding said further numbers with said fixed numbers.

4,393,741

ELECTRONIC ORGAN CIRCUIT

Gerald A. Budelman, Aloha, Oreg., assignor to CBS, Inc., New York, N.Y.

Filed Jun. 1, 1981, Ser. No. 269,652
Int. Cl.³ G10B *3/10*; G10H *1/24*
U.S. Cl. 84—1.01 **16 Claims**



1. In an electronic organ provided with a plurality of input keyboard keys, a plurality of stops, plural input circuits for providing input waveform signals of different frequencies, and keyer circuits operative in response to actuation of selected keys for gating waveform signals from said input circuits to keyer output circuitry,

separate means each effective for providing enabling pulses for operating a given keyer to an on condition for coupling a said waveform signal, each of said separate means being controllable to provide a different enabling pulse at a different time for a controllably different length of time to said given keyer,

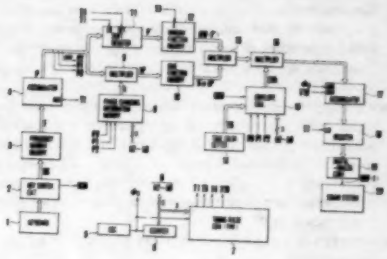
wherein each of said separate means is responsive to a key of said keyboard for operating said given keyer to an on condition, with the separate means being separately responsive according to operation of stops of said organ.

4,393,742

ELECTRONIC MUSICAL INSTRUMENTS OF THE TYPE SYNTHESIZING A PLURALITY OF PARTIAL TONE SIGNALS

Masatada Wachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 12, 1981, Ser. No. 292,052
Claims priority, application Japan, Sep. 8, 1980, 55-124929
Int. Cl.³ G10H *1/06*
U.S. Cl. 84—1.23 **8 Claims**



1. An electronic musical instrument comprising:

means for producing a time window signal;

means for producing a plurality of predetermined partial tone signals;

first control means connected to said time window signal producing means for controlling a time width of said time window signal;

second control means connected to said partial tone signal producing means for controlling the frequency of each of said partial tone signals and assigning said partial tone signals to respective time divisioned time slots;

modulating means for modulating said partial tone signals with said time window signal and producing modulated partial tone signals in said time divisioned time slots respectively; and

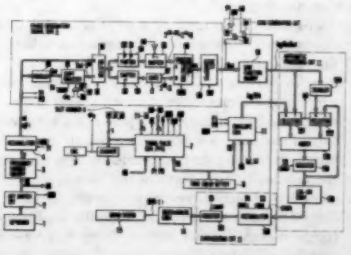
synthesizing means connected to said modulating means for synthesizing said modulated partial tone signals and producing a musical tone signal.

4,393,743

ELECTRONIC MUSICAL INSTRUMENTS OF THE TYPE SYNTHESIZING A PLURALITY OF PARTIAL TONE SIGNALS

Masatada Wachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 10, 1981, Ser. No. 301,014
Claims priority, application Japan, Sep. 24, 1980, 55-133261
Int. Cl.³ G10H *1/08, 7/00*
U.S. Cl. 84—1.23 **13 Claims**



1. An electronic musical instrument of the type in which a

musical tone is synthesized from a plurality of windowed partial tone components, comprising:

time window signal generating means for separately generating for each of said windowed partial tone components a time window signal having a time width;

frequency signal generating means for separately generating for each of said windowed partial tone components a frequency signal having a frequency;

tone color setting means for setting a tone color selected among a plurality of tone colors;

control means connected to said tone color setting means for determining said time widths of said time window signals generated by said time window signal generating means and said frequencies of said frequency signals generated by said frequency signal generating means in accordance with the set tone color;

modulating means for amplitude modulating each frequency signal with the time window signal for the corresponding windowed partial tone component and for combining the resultant modulated signals to produce a combined signal containing a plurality of partial tone components whose frequencies are determined by said time widths and said frequencies; and

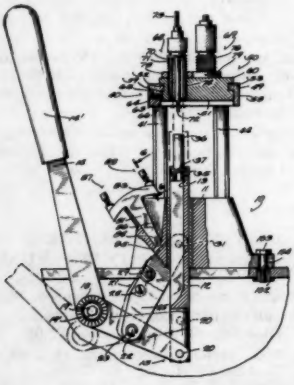
sound system means for converting said combined signal to a musical tone.

4,393,744

PRESS FOR RELOADING RIFLE AND PISTOL CARTRIDGES

Richard J. Lee, 3146 Kettle Moraine Rd., Hartford, Wis. 53027

Filed Jul. 6, 1981, Ser. No. 280,677
Int. Cl.³ F42B *33/02*
U.S. Cl. 86—25 **6 Claims**



1. A press for reloading cartridges comprising:

a base member,

an elongated ram mounted for moving axially upwardly and downwardly on the base member and a holder at an end of the ram for holding a cartridge,

means for driving the ram axially in opposite directions,

a turret ring and means for supporting said turret ring rigidly above the base member in a plane that is transverse to the axis of the ram, said turret ring having an axially directed bore and bearing surface means on said ring circumjacent the nominally upper end of the bore,

a generally circular turret for supporting dies that act on said cartridge, said turret having radially outwardly extending flange means radially remote from its center which outwardly extending flange means interface with said bearinng surface to support said turret for rotating in in said bore of the turret ring, and

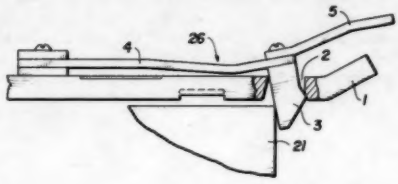
means for restraining said turret from moving axially upwardly when a force is applied to it by the ram.

4,393,745

RELEASABLE RETAINER FOR EJECTION TUBE

Henry C. Mayo, and William V. Millman, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 30, 1981, Ser. No. 288,624
Int. Cl.³ F41F *3/04*
U.S. Cl. 89—1.806 **9 Claims**



1. A detent assembly including a slotted support defining at least one slot therein by an inside wall, said slotted support mounted on a hollow support, the detent assembly to detain a movable item in the hollow support, the detent assembly having a spring connected to the slotted support, a restraining tooth connected to the spring such that the spring biases the restraining tooth through the slot in the slotted support and wherein the restraining tooth is rotated against the bias of the spring by movement thereagainst of the item, such that:

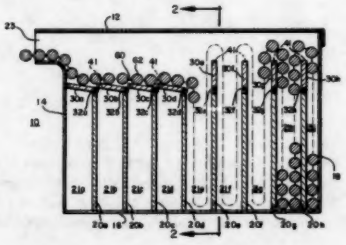
as the restraining tooth is rotated against the bias of the spring, the restraining tooth is forced against the inside wall of said slot in the slotted support preventing movement of the item within the hollow support in a first direction.

4,393,746

AMMUNITION MAGAZINE WITH BUILT-IN COMPARTMENT COVERS

John G. Rocha, Dover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 31, 1981, Ser. No. 288,826
Int. Cl.³ F41D *10/14*
U.S. Cl. 89—34 **7 Claims**



1. An ammunition magazine comprising a plurality of compartments formed by vertical separators for holding rounds linked by a belt and at least one compartment cover, said compartment cover rotatably mounted immediately above one of said vertical separators for either opening or closing one of said compartments, said compartment cover having an opened position when said rounds are disposed inside said one of said compartments and a closed position when said one of said compartments is emptied of said rounds, wherein said compart-

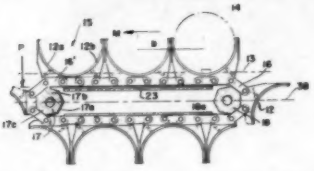
ment cover is radially extended from said one of said vertical separators forming a substantially continuous surface with said one of said vertical separators, and said compartment cover forming a single vertical plane with said one of said vertical separators when in said opened position, and extending in a direction substantially perpendicular to said one of said vertical separators when in said closed position.

4,393,747

LOADING TABLE

Olle Gustavsson, and Göran Sundmar, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Dec. 18, 1980, Ser. No. 217,635
Claims priority, application Sweden, Dec. 18, 1979, 7910436
Int. Cl.³ F41F *9/02*
U.S. Cl. 89—45 **8 Claims**



1. A firearm loading table for receiving a plurality of ammunition units and individually depositing said ammunition units comprising:

an endless chain supported by first and second sprockets, forming upper and lower horizontal chain segments;

a plurality of holding trough segments connected to said endless chain, and perpendicular therewith, pairs of said holding trough segments abutting each other along said upper segment to form a trough member for receiving an ammunition unit, said holding trough segments having a rear edge at the center thereof for coacting with a front edge of a section of the ammunition unit for fixing the ammunition unit against forward motion;

stop means;

a support member for holding said stop means an adjustable preselected distance from one end of said trough members to form an adjustable stop means whereby motion of an ammunition unit in a direction of said one end is restricted; and

means for rotating said sprockets to incrementally move said endless chain a distance substantially equal to the distance between centers of said holding troughs, whereby said segments on said upper horizontal segment advancing towards the end of the said horizontal segment separate, releasing an ammunition unit, the rear segment of a trough pushing said released ammunition unit into a receiving plane.

4,393,748

DEVICE FOR STRIPPER

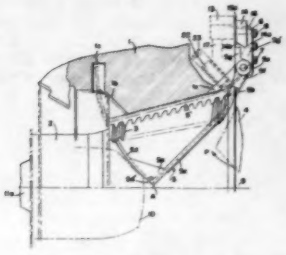
Sten Hallqvist, and Erik Eriksson, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Dec. 18, 1980, Ser. No. 217,595
Claims priority, application Sweden, Dec. 18, 1979, 7910442
Int. Cl.³ F41F *9/06*
U.S. Cl. 89—47 **7 Claims**

1. In a firearm having a chamber for receiving a shell and powder charge, a ramming unit for inserting said shell and powder charge in said chamber, a threaded breech ring and closing screw for maintaining said chamber closed, the improvement comprising:

an elongated stripper for holding the powder charge in the chamber during extraction of said ramming unit, said stripper being connected at one end to swing from a first charge holding position to a second position for maintaining said stripper from striking said powder charge;

a blocking means for maintaining said stripper in said second position until said ramming unit moves said shell and powder charge into said chamber including a longitudinal blocking rod having at one end thereof an actuator for longitudinally displacing said rod in response to movement of said ramming unit, and a displacement means connecting said stripper with a remaining end of said



blocking rod, whereby motion of said rod releases said stripper from said second position to assume said first position under the influence of a spring force against said stripper; and,

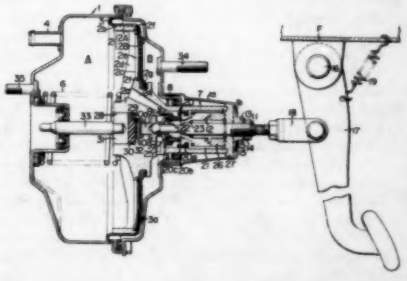
means for moving said stripper from said first position to said second position in response to closing said screw with said breech ring whereby said stripper is maintained in place avoiding contact with a subsequent shell and powder charge.

4,393,749

VACUUM ACTUATED TYPE BOOSTER DEVICE

Yoshihisa Miyazaki, Ueda, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Sep. 26, 1980, Ser. No. 191,354
Claims priority, application Japan, Sep. 27, 1979, 54-124636
Int. Cl.³ F15B *9/10*; F01B *19/00*; F16J *3/00*
U.S. Cl. 91—376 R **5 Claims**



1. In a vacuum actuated booster device having a booster shell, a booster piston reciprocatably received in the booster shell, a diaphragm connected at its inner peripheral portion to the rear side of a radial disc portion of said booster piston and at its outer peripheral portion to the peripheral wall of said booster shell, a first working chamber and a second working chamber defined in said booster shell by said booster piston and said diaphragm, a vacuum source with which said first and second working chambers are normally communicated, an input rod slideably mounted in said booster piston, and valve means connected to atmosphere for bringing said second working chamber into communication with ambient air by the

forward movement of said input rod so that said booster piston is driven forwardly by the differential pressure between said first and second working chambers,

an improvement wherein said booster piston comprises a piston body having a disc portion with windows and porous thin-walled members covering said windows, said diaphragm contacting said porous thin-walled members closing said windows.

4,393,750

BRAKE BOOSTER

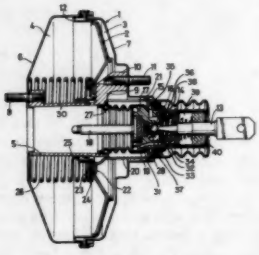
Wilfried Wagner, Frankfurt am Main, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,134

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029911

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—376 R **9 Claims**



1. A brake booster for automotive vehicles comprising:

a low-pressure casing having a longitudinal axis;

an axially movable wall disposed in said casing in a coaxial and transverse relationship with said axis to subdivide said casing into a low-pressure chamber and a working chamber;

a mechanically actuatable control valve to connect said working chamber to a selected one of said low-pressure chamber and atmosphere, said control valve being disposed in an axially movable control valve housing disposed coaxial of said axis in communication with a master cylinder piston actuating push rod;

a force-transmitting sleeve having a plurality of longitudinal slots disposed in said casing coaxial of said axis, one end of said sleeve being connected to said housing and the other end of said sleeve being connected to said movable wall; and

a reinforcement tube extending coaxial of said axis through said casing having an outside diameter less than the inside diameter of said sleeve, said tube being sealed to said movable wall, having one end connected to one end wall of said casing in a transverse relationship to said axis adjacent said low-pressure chamber and having a plurality of radial extensions adjacent the other end of said tube in said working chamber, each of said plurality of radial extensions extending through a different one of said plurality of longitudinal slots and connected to the other end wall of said casing in a transverse relationship with said axis adjacent said working chamber.

4,393,751

TWO HOLE HYDRAULIC CUSHION VALVE

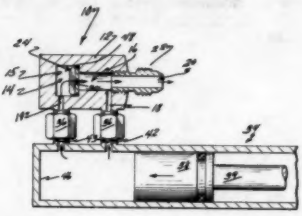
Clarence R. Kelley, Mishawaka, Ind., assignor to C. C. Kelley & Sons, Mishawaka, Ind.

Filed Jan. 21, 1981, Ser. No. 226,750

Int. Cl.³ F15B *15/22*

U.S. Cl. 91—408 **4 Claims**

1. In a cylinder having a fluid actuated piston therein, said piston being shiftable longitudinally within said cylinder by the operation of said fluid, the improvement wherein said cylinder includes two ports at one end for evacuating fluid from in front of said piston as it is urged toward said one cylinder end and for introducing fluid at the rear of said piston to urge it away from said one cylinder end, said cylinder ports being spaced longitudinally apart along the direction of travel of said piston within said cylinder with one port nearer said cylinder end than the other port, said piston being shiftable over said other cylinder port, a valve for evacuating and introducing fluid from and into said one cylinder end, said valve having first, second and third passages, each of said first and second passages in spaced communication with said third passage in the valve, a fluid flow restrictor means within said third valve passage and shiftable therein in response to fluid flow from a



non-operative position to an operative position between said first and second passages for reducing the rate of fluid flow from said first valve passage into said third valve passage, said first valve passage in communication with said one cylinder port, said second valve passage in communication with said other cylinder port whereby fluid will first flow through both said first and second valve passages and out said third valve passage as the piston approaches said one cylinder end and then flow only through said first and third valve passages at a reduced rate after said piston shifts over said other cylinder port to provide a cushioning resistance to the movement of said piston.

4,393,752

PISTON COMPRESSOR

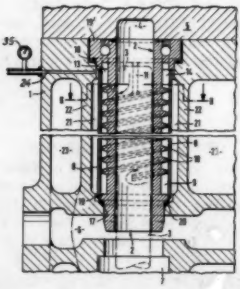
Hans Meier, Kollbrunn, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 9, 1981, Ser. No. 232,975

Claims priority, application Switzerland, Feb. 14, 1980, 1209/80

Int. Cl.³ F01B *31/00*

U.S. Cl. 92—86 **11 Claims**



1. A piston compressor comprising a cylinder block; a double walled cylinder liner mounted in said cylinder block, said cylinder liner having a first wall defining a bore for reciprocation of a piston therein and a second wall annularly spaced from said first wall to define an annular chamber therebetween

for receiving a coolant, said second wall being spaced from a wall of said cylinder block to define an annular space therebetween;

a collecting chamber in said cylinder block for receiving leakage gas, said collecting chamber being in communication with said bore of said cylinder liner;

a vent line in said block communicating with said annular space; and

a pressure gauge connected to said vent line.

4,393,753

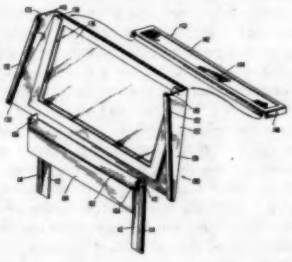
ATTACHMENT FOR MOTOR VEHICLES WITH REAR WINDOWS

Richard Chatlos, Johnstown, Pa., assignor to Air-O-Scoop Corporation, Johnstown, Pa.

Continuation of Ser. No. 194,224, Oct. 6, 1980, Pat. No. 4,346,648, which is a continuation-in-part of Ser. No. 118,444, Feb. 4, 1980, Pat. No. 4,326,451. This application May 12, 1982, Ser. No. 377,564

Int. Cl.³ B10J 1/20

U.S. Cl. 98—2.12 18 Claims



1. A window containing an air flow device for a closed motor vehicle or boat for positioning in the rear aperture thereof, which comprises a window frame, two outer window sections which are stationary and mounted in the end portions of said window frame, said two outer window sections begin of such size as to form an opening therebetween, and said air flow device mounted in said opening, said air flow device comprising a base plate, a bottom lip attached on top to said base plate, and on bottom to the bottom portion of said window frame, two vertical side plates, each having one end attached to the end of the base plate, a narrow top horizontal plate attached on each end to the vertical side plates on the side towards the opening, a top vertical lip attached to the edge of said top plate towards said opening, part of the ends of said top vertical lip being attached to said side plates, a back plate which is attached at its bottom to the portion of said base plate inside of said motor vehicle and is positioned with its top away from said top horizontal plate or the vertical plane of said opening thereby forming a gap between said top horizontal plate and said back plate, and an extension of the edge of each of said side plates facing said opening which provides means of sealingly engaging the end of one of said outer window sections facing the opening, at least said back plate being transparent, said two side plates being generally triangular in shape, being attached on one edge to said back plate and preventing lateral air flow.

4,393,754

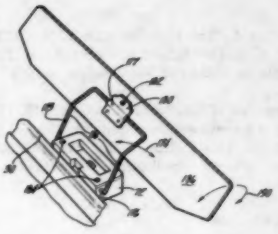
AIR DEFLECTION ASSEMBLY FOR VEHICLE SUNROOFS

Louis E. Hough, 22448 Statler, St. Clair Shores, Mich. 48081, and Walter J. De Vigili, 16082 Dugan Rd., Roseville, Mich. 48066

Filed Oct. 8, 1980, Ser. No. 195,151

Int. Cl.³ B60J 7/00

U.S. Cl. 98—2.14 8 Claims



1. An air deflection assembly for use with a vehicle having a sunroof opening in the roof thereof, comprising:

an air deflecting member extending transverse to said opening for deflecting air flowing over said roof and through or over said opening; and

mounting means for mounting said deflecting member adjacent the leading edge of said opening for independent pivotal movement about first and second transversely extending axes, whereby to permit adjustment of both the elevation and inclination of said deflecting member.

4,393,755

HEAT TREATMENT OF PARTICULATE SOLID MATERIALS

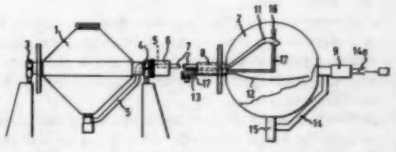
Graham S. Cattell, Lingfield, and John E. Brittain, Beaconsfield, both of England, assignors to The A.P.V. Company Limited, Crawley, England

Filed Feb. 13, 1981, Ser. No. 234,868

Claims priority, application United Kingdom, Feb. 15, 1980, 8005147

Int. Cl.³ A47J 27/04

U.S. Cl. 99—348 4 Claims



1. In apparatus for the batchwise heat treatment of particulate solid material, comprising a heat treatment vessel mounted on hollow trunnions for rotation about a generally horizontal axis and shaped so as to impart a tumbling action to the solid material therein as the vessel rotates, the heat treatment vessel having a fluid inlet leading via one of the hollow trunnions, and a discharge outlet for withdrawal of the total solids and liquids contents of the vessel via one of the hollow trunnions; the improvement of a second rotary vessel for subsequent treatment of the material discharged from the said heat treatment vessel, the second rotary vessel also being mounted on hollow trunnions and being provided with a first connection to said discharge outlet of said heat treatment vessel for receiving solids and liquids therefrom and a second connection for the supply and discharge of fluid, each of said connections being via one of the hollow trunnions and with strainer means therein

at a location to trap solids as the solids and liquids enter from the heat treatment vessel for separating the solid particles from the liquid whereby liquid withdrawn from the heat treatment vessel and introduced into the second vessel with the solids may be separated therefrom for discharge via said second connection, the strainer means being adjustable whereby the solids may be allowed to drop from the strainer means and mixed by tumbling the second rotary vessel with a further liquid introduced via the said second connection.

4,393,756

STEAM PEELING OR COOKING APPARATUS

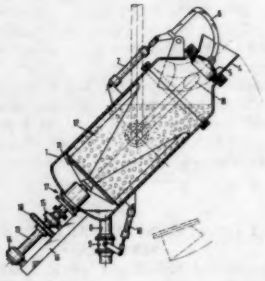
Peter W. C. van der Schoot, Ouderkerk a/d IJssel, Netherlands, assignor to Goudsche Machinefabriek B.V., Gouda, Netherlands

Continuation of Ser. No. 235,368, Feb. 19, 1981, abandoned, which is a continuation of Ser. No. 104,990, Dec. 18, 1979, abandoned. This application Jul. 21, 1982, Ser. No. 400,311

Claims priority, application Netherlands, Dec. 29, 1978, 7812678

Int. Cl.³ A23N 7/00

U.S. Cl. 99—348 **8 Claims**



1. A steam peeling apparatus for plant products such as potatoes, carrots, celery, red beets, Swedish turnips, apples and the like, comprising:

a substantially cylindrical peeling vessel having a product opening at one end closable by a closure mounted for movement within the vessel and a liquid discharge outlet at the other end;

means mounting the vessel for only tilting movement around a horizontal axis from a normally operating longitudinally inclined position wherein the one end is above the other end to a discharge position wherein the other end is above the one end;

a partition disposed in the vessel at said other end perpendicular to the longitudinal axis thereof and spaced from the liquid discharge outlet, wherein the partition is configured, when the vessel is in the normally operating position, to prevent passage of product to be peeled while allowing condensate to pass therethrough to form a condensate collection space thereunder such that the product to be peeled does not lie in the condensate during the application of steam;

steam supply and discharge means comprising an access opening in the vessel disposed above the product level when the vessel is in the normally operating position, a first steam line disposed colinearly with the horizontal tilting axis and a second line connecting the first line to the access opening; and

at least one stirring arm disposed above the partition and axially along the wall of the vessel and means for rotating same about the longitudinal axis of the vessel when the vessel is in the normally operating position.

4,393,757

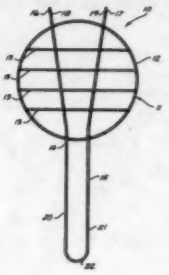
FOOD POUCH COOKING HOLDER

Clifford W. Welsh, 1622 Sonata La., Lake San Marcus, Calif. 92069

Filed Oct. 26, 1981, Ser. No. 314,955

Int. Cl.³ A47J 37/00

U.S. Cl. 99—369 **2 Claims**



1. A food pouch cooking holder suitable for cooking in pots of hot water, comprising:

a regular shaped, multiple wire member welded flat frame having an exterior frame of regular shape and multiple cross frame members permanently secured together,

a pair of diverging wire support frame members disposed fully across the regular shaped flat frame and permanently secured thereto, said diverging pair of frame members having a pair of free termini projecting beyond one exterior frame edge, and a second pair of termini formed in parallel and projecting beyond the opposed second exterior frame edge and having a first U-bend terminus,

a pair of curved horizontal extending securing means formed on the pair of first termini of aforesaid pair of diverging wire support frame members, said pair of securing means adapted to be secured to the top rim of a cooking pot,

a slidable, frictionally secured fastener disposed on aforesaid second pair of termini disposed in parallel, said fastener having a forward positioned securing means engagable with said cooking pot top rim, and a rearward positioned pusher means, said fastener providing a third securing means securing said cooking holder on said cooking pot,

said pair of diverging wire support frame members also disposed in a second U-bend, adapted and sized to provide a required depth of immersion of said regular shaped, multiple wire frame inside of said cooking pot, and,

said cooking holder capable of securing in said cooking pot and securing a cooking food pouch under said holder in water during a cooking time period.

4,393,758

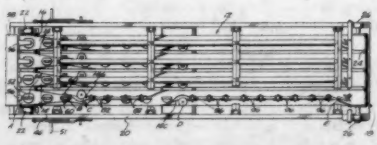
FOOD PROCESSING APPARATUS

Al Anmahian, El Monte, Calif., assignor to Electra Food Machinery, Inc., El Monte, Calif.

Filed Jul. 17, 1981, Ser. No. 284,171

Int. Cl.³ A21C 9/00, 9/06

U.S. Cl. 99—450.6 **7 Claims**



1. An apparatus for forming a Mexican food product having

an exterior wrap comprising a tortilla and an inner filling, comprising:

(a) an elongated longitudinally extending supporting frame work;

(b) a driving drum rotatably supported proximate one end of said framework;

(c) a driven drum rotatably supported forwardly of said driving drum rotatably supported proximate one end of said framework;

(d) a continuous, yieldably deformable endless conveyor belt carried by said driving and driven drums, said belt having an upper and a lower surface, said lower surface including a downwardly depending "V" shaped protuberance extending the entire length of said belt;

(e) means for driving said driving drum at a predetermined rate of speed;

(f) a pair of angularly, upwardly extending rollers supported by said framework and adapted to rollably engage the lower surface of said conveyor belt said rollers being adapted to rotate respectively about axes extending at an angle with respect to the plane of said conveyor belt;

(g) a first flanged wheel supported by said framework and disposed on a first side of said conveyor belt, said wheel being adapted to rotate about an axis disposed generally perpendicular to the plane of said conveyor belt; and being adapted to fold a first portion of said conveyor belt transverse to the line of travel of the belt to move a first side portion of the tortilla into overlapping pressural contact with the inner filling;

(h) a second flanged wheel supported by said framework and disposed on a second side of said conveyor belt, said wheel being adapted to rotate about an axis disposed generally perpendicular to the plane of said conveyor belt, and being adapted to fold a second portion of said conveyor belt transversely of the line of travel of the belt to move a second side portion of the tortilla into overlapping pressural contact with said first portion of the tortilla to form a shaped product wherein the inner filling is substantially encapsulated within the tortilla;

(i) a plurality of longitudinally spaced apart rotatable flanged wheels carried by said framework intermediate said first and second flanged wheels adapted to maintain said first portion of said tortilla in pressural contact with the inner filling;

(j) a plurality of longitudinally spaced apart rotatable flanged wheels carried by said framework forwardly of said second flanged wheel adapted to maintain said second portion of said tortilla in pressural contact with said first portion of said tortilla; and

(k) a plurality of longitudinally spaced apart rotatable guide wheels carried by said framework adapted to engage said "V" shaped protuberance on said belt to guide longitudinal travel of said belt over said driving and driven drums.

4,393,759

CHEESE MAKING APPARATUS

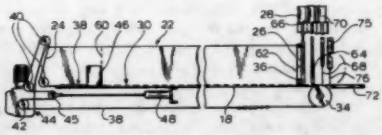
Guy Quilliou, Niort, France, assignor to Pierre Guerin S.A., Mauze-sur-le-Mignon, France

Filed Dec. 30, 1981, Ser. No. 335,763

Claims priority, application France, Jan. 15, 1981, 81 00611

Int. Cl.³ A01J *25/00*; A23C *19/072*

U.S. Cl. 99—459 **14 Claims**



1. A cheese making apparatus for producing cheese from a pressed mass of curds wherefrom the whey has been drained, which comprises

(a) a rectangular vat including

(1) a bottom wall,

(2) two longitudinally extending side walls,

(3) a fixed end wall and

(4) a mobile end wall opposite the fixed end wall, the side and end walls defining interior dimensions of the vat,

(b) a pressing plate arranged to be lowered into, and lifted out of, the vat, the pressing plate having outer dimensions slightly smaller than the interior dimensions of the vat,

(c) a filtering sheet supported on the bottom wall of the vat for displacement in a direction parallel to the side walls,

(d) a transverse partition affixed to an end of the filtering sheet adjacent the fixed end wall of the vat for displacement with the filtering sheet in said direction, the partition defining with the side walls, the bottom wall and the mobile end wall an operating volume of the vat determining the amount of curds to be held in the vat, and displacement of the partition changing the operating volume, and the transverse partition being elastically compressible in a vertical direction whereby lowering of the pressing plate into the vat compresses the partition and permits the plate to apply pressure to the curds held in the vat, and

(e) means for simultaneously displacing the filtering sheet and the transverse partition affixed thereto in said direction.

4,393,760

JUICER

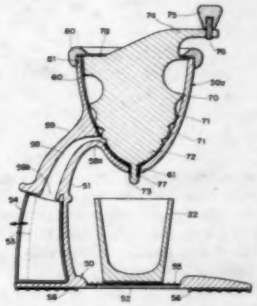
Tokuichiro Hasegawa, No. 18-6, 5-chome, Kanayama, Naka-ku, Nagoya-shi, Aichi-ken, Japan

Continuation of Ser. No. 137,445, Apr. 4, 1980, abandoned. This application May 7, 1981, Ser. No. 261,387

Claims priority, application Japan, Apr. 12, 1979, 54-47599[U]

Int. Cl.³ A23N *1/02*

U.S. Cl. 99—510 **12 Claims**



1. A juicer comprising a housing having a top portion with a raw material supplying mouth, a plurality of cutters, a support structure for said housing, a roll for pressing the raw material and a link means engaging the top portion for holding the roll within said housing; wherein

said housing has a bowl shaped structure with an exhaust port disposed at an intermediate portion thereof for removal of draff after pressing of said raw material, and further with an opening disposed at the bottom portion thereof for removal of juice produced by said pressing of said raw material;

said plurality of cutters are arranged in vertical length in an inner wall of said housing;

said roll has a convex bowl shape corresponding to the inner shape of said housing and substantially fit within said housing, and further comprising spiral shaped top portion, spiral shaped intermediate portion and a bowl shaped bottom

portion, said spirals having their threads running vertically, and said top spiral having a larger space between each thread than the intermediate spiral, said bottom portion including a projection at the bottom thereof, said projection fitting into said opening disposed at the bottom of said housing, and wherein said bottom portion and said projection have a plurality of vertical grooves therein and terminating toward the end of said projection whereby squeezed juice will flow by gravity through said vertical grooves and out of said opening of said housing; and wherein

said roll is positioned with the portion between the intermediate spiral and the bottom portion being disposed adjacent said exhaust port, whereby said raw material is fed into said supplying mouth and by operating said roll, said raw material is pressed against said cutters first grossly by the upper spiral and then finely by the intermediate spiral, and then the resulting draff of said raw material is exhausted through said exhaust port and the resulting juice flows through said vertical grooves of said bottom portion and through said vertical grooves of said projection and through said opening at the bottom of said housing.

4,393,761

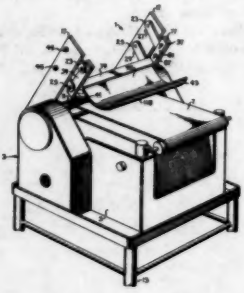
FLOATING KNIFE ASSEMBLY FOR A MEAT DEFATTING MACHINE

Robert P. Murphy, 1807 Commercial, St. Joseph, Mo. 64503

Filed Jul. 6, 1981, Ser. No. 281,006

Int. Cl.³ A22C *17/12*

U.S. Cl. 99—589 **8 Claims**



1. A meat defatting machine for severing, from a succession of pieces of meat each having a red meat layer of constant thickness and a fat layer of varying thickness, a portion of said fat layer in excess of a desired total thickness of red meat layer and fat layer; said machine comprising:

(a) a housing;

(b) a knife blade;

(c) conveyor means associated with said housing to present a succession of pieces of meat past said knife blade;

(d) link means freely pivotally connecting said knife blade to said housing to allow said knife blade to be positioned over a continuous range of positions above said conveyor means;

(e) gauge means communicating with said knife blade and engageable with said pieces of meat to automatically position said knife blade a distance above said conveyor means to sever from said pieces of meat a portion of the fat layer thereof in excess of a desired total thickness of red meat layer and fat layer remaining after said severance; wherein said link means includes:

(1) a pair of spaced apart, vertically oriented, parallel support members rigidly connected to said housing;

(2) a forward pair of spaced apart, vertically oriented, parallel mounting plates aligned with said support members and parallel thereto; said knife blade being mounted on and extending between said forward plates and supported thereby;

(3) a pair of upper and lower parallel links having each end thereof pivotally connected to an associated one of said support members and mounting plates respectively thereby forming a parallelogram.

4,393,762

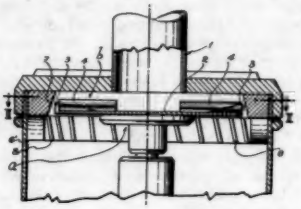
SUNFLOWER SEED DEHULLING MACHINE

Wilson E. Jacobs, Buenos Aires, Argentina

Continuation of Ser. No. 142,018, Apr. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 30,372, Apr. 16, 1979, abandoned, which is a continuation of Ser. No. 852,929, Nov. 18, 1977, abandoned, which is a division of Ser. No. 636,994, Dec. 2, 1975, abandoned. This application Apr. 19, 1982, Ser. No. 369,814

Int. Cl.³ B02B *3/00, 7/02;* **B02C** *9/02*

U.S. Cl. 99—609 **5 Claims**



1. A rotor especially adapted for dehulling sunflower seeds, comprising:

a disc adapted to be rotated;

means for feeding sunflower seeds to a central portion of said disc;

substantially straight radially-disposed blades mounted on said disc extending from the edge of said disc to a position adjacent said central portion thereof for guiding the sunflower seeds from said central portion radially outward therefrom to the edge of said disc whereby the seeds are ejected radially outwardly of said disc along said blades by centrifugal force, said blades comprising a plate inclined with respect to said disc in the direction of disc rotation and forming with said disc a radial channel having a height conforming to the thickness of sunflower seeds adapted to orient the seeds with their major axes parallel to the radial channel axis as the seeds are ejected outwardly along said blades;

an annular impact ring surrounding said disc; and

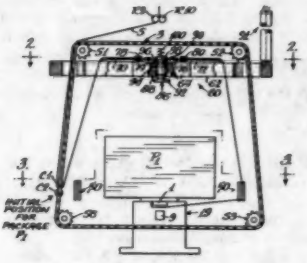
means for sweeping seeds out of the path of said blades to clear the path of seed portions which rebound off said impact ring and avoiding interference by said rebounding seed portions with the seeds being ejected outwardly and maintaining said outwardly ejected seed in their proper orientation with their major axes parallel to the radial channel axis as the seeds are ejected outwardly of said disc toward said impact band, said sweeping means comprising fins mounted on said disc in front of said blades in the direction of disc rotation and extending radially outward of said disc beyond the most radially outward portion of said blades to a position spaced slightly inwardly from the face of said impact ring and each of said fins being constructed and arranged to intercept rebounding seed portions conveyed to the impact ring by the blade preceeding in the direction of disc rotation and to divert said rebounding seed portions away from the path of the sunflower seeds conveyed to the impact ring by the blade following in the direction of disc rotation.

4,393,763

METHOD AND APPARATUS FOR PRE-DRAPING AN OBJECT RECEIVING STATION WITH FLEXIBLE BINDING

L. Peter Sauer, Glenview, and Ronald W. Gurak, Fox River Grove, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed May 8, 1981, Ser. No. 261,969
Int. Cl.³ B65B 13/10
U.S. Cl. 100—2 12 Claims



1. In a chuteless method for forming a loop of flexible binding about objects positioned seriatim in an object receiving station, said method including restraining an end of said binding adjacent said receiving station and then pulling a trailing portion of the binding in a closed path around an object; said method characterized by the improvement comprising:

(a) while a previously bound first object is in said receiving station, initially pulling said trailing portion of the binding through a major portion of the locus of said closed path around the receiving station and guiding spaced portions of said binding from the interior of said path around said receiving station to retain the binding in a configuration spaced outwardly of said receiving station;

(b) after commencing step (a), removing the bound first object from said receiving station;

(c) positioning a second object in said receiving station; and

(d) after terminating step (c), terminating said interior guiding of the binding around said receiving station to permit said binding to contact said second object while further pulling said trailing portion of the binding completely around said closed path and to then form a tensioned loop about the second object.

4,393,764

ROUND BALER WITH A DISCHARGE GATE FOR REARWARDLY MOVING A BALE

Jean Viaud, Gray, France, assignor to Deere & Company, Moline, Ill.

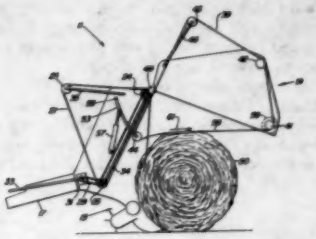
Filed Aug. 20, 1981, Ser. No. 294,651
Claims priority, application France, Aug. 20, 1980, 80 18200
Int. Cl.³ B30B 5/06; A01D 39/00
U.S. Cl. 100—88 6 Claims

1. In a round baler comprising:

a plurality of transverse rollers;

means supported on said rollers and defining a bale forming chamber for forming a bale of generally cylindrical shape; and

a bale discharge gate means for opening said chamber and discharging said bale on the ground; the improvement comprising:



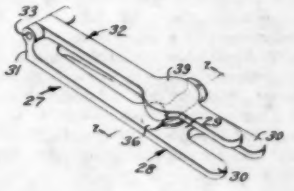
said gate means further comprising bale drive means for contacting a bale discharged on the ground and for displacing said bale along the ground away from said baler.

4,393,765

ALUMINUM CAN COMPACTOR

Albert Accettura, and Wanda J. Accettura, both of 25502 Jacyln Ave., Sunnymead, Calif. 92388

Filed Jul. 27, 1981, Ser. No. 286,853
Int. Cl.³ B30B 9/32
U.S. Cl. 100—98 R 2 Claims



1. An aluminum can compactor device, comprising, in combination, a base member and a handle pivotally connected thereto by a hinge at one end of said base member and one end of said handle, said base member including a pair of parallel, elongated legs, a web between a longitudinally intermediate portion of said legs, a raised stage portion upon said web and an upward spike upon said raised stage portion; and a circular portion along a longitudinally intermediate portion of said handle being aligned with said stage of said web when said handle is pivoted in a closed position against said base member, and an upwardly recess on an underside of said handle circular portion.

4,393,766

BELT PRESS WITH HOSE-TYPE ACTUATOR

Peter Thies, Ennepetal-Voerde, Fed. Rep. of Germany, assignor to Wagener Schwelm GmbH & Co., Schwelm, Fed. Rep. of Germany

Filed Jul. 24, 1981, Ser. No. 286,670
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1980, 3028400
Int. Cl.³ B30B 15/06
U.S. Cl. 100—99 10 Claims

1. A belt press comprising:

a plurality of upper and a plurality of lower traverses respectively having lower and upper traverse faces;

respective upright tie bolts extending vertically between said upper and lower traverses and securing said lower traverses to the respective upper traverses;

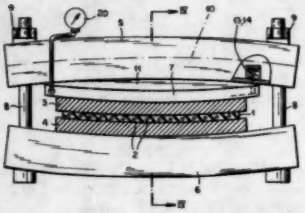
upper and lower press platens carried on and between said traverses and having respective upper and lower platen

faces respectively confronting said lower and upper traverse faces;

hydraulic actuating means for displacing said traverses toward each other and thereby pressing said platens against a belt engaged therebetween, said means being engaged between one of said platen faces and the confronting traverse face and having

a pressure plate bearing on said one platen face,

a plurality of diametrically compressible but circumferentially unstetchable hydraulic hoses forming at least one substantially closed chamber and bearing in one direction in surface contact on said pressure plate and in the opposite direction surface contact at least indirectly on said confronting traverse face, said hoses having in uncompressed condition a predetermined hose diameter but being partially flattened between said plate and said confronting traverse face, and



means for pressurizing said chamber;

means for displacement of said plate toward and away from said confronting traverse face only through a distance substantially shorter than said diameter; and

at least one bend-compensating element having a pair of nonparallel upper and lower surfaces and engaged between said hydraulic actuating means and one of the respective faces.

4,393,767

VERTICAL REFUSE COMPACTOR

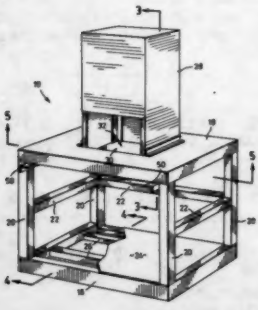
James H. Dutfield, Palgrave, Canada, assignor to Reftech Limited, Woodbridge, Canada

Filed Aug. 28, 1981, Ser. No. 297,196

Claims priority, application Canada, Aug. 11, 1981, 383644

Int. Cl.³ B30B *15/30*

U.S. Cl. 100—229 A **16 Claims**



1. A compactor for compacting material in an open topped receptacle comprising:

an enclosure structure including a bottom side, a coextensive top side and rigid vertical post structures extending between and connecting said bottom and top sides, the top side having an opening for passing refuse material therethrough;

said bottom side including a receptacle support surface which is inclined from a high front end to a low rear end;

the enclosure structure defining a front opening for passing a receptacle therethrough;

means for retaining a receptacle on said support surface, said retaining means preventing horizontal movement of said receptacle in any horizontal direction except in a direction up said inclined surface out of said front opening; and

a compactor device mounted on the top side over said top side opening, said compactor device including a ram member mounted for reciprocal, vertical movement into and out of a receptacle arranged on said support surface,

said compactor device having a refuse receiving opening located below the ram for passing refuse therethrough and through the top side opening into a receptacle.

4,393,768

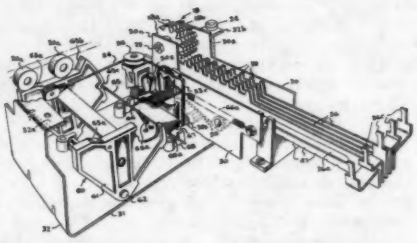
VARIABLE DATA IMPRINTER WITH RACK CENTERING AND CARRIAGE INTERLOCK MECHANISM

William P. Barbour, Mount Prospect, Ill., assignor to Security Imprinter Corporation, Walkersville, Md.

Continuation of Ser. No. 146,098, May 2, 1980, abandoned. This application Feb. 26, 1982, Ser. No. 352,931

Int. Cl.³ B41F *3/60*

U.S. Cl. 101—45 **10 Claims**



1. A variable data imprinting machine comprising an elongated flat printing bed section providing a document supporting surface and including a print wheel pack adjacent said surface formed of rotatable, coaxial side-by-side closely adjacent print wheels each having circumferentially spaced raised-number-bearing imprint block formations separated by notches about their peripheries for imparting impressions to a document on said surface, an imprinting carriage movable from a parking position at one end of said surface through advance and return strokes longitudinally along the document support surface having a roller platen for transfer of imprinted characters to the document during one of said strokes, an elongated rack housing portion underlying and extending beyond the printing bed section defining a rack adjustment control panel projecting from a side of the printing bed section, a plurality of toothed racks slidable longitudinally in said rack housing portion with teeth of each of the racks engaging notches of the respective print wheels to rotatably index the print wheels to selected number-printing positions, means slidably supporting and guiding the toothed racks for longitudinal wheel-indexing movement subjacent the print wheels of the wheel pack, said racks having downwardly facing centering notches along their lower edges in predetermined positional relationship to said teeth, a rack centering mechanism including a blade member underlying the racks having a blade movable into and out of said notches and lifting means for raising said blade member and a control leg, a pivoted quadarant member of generally sector-shaped elevational profile located subjacent said parking position and pivoted adjacent the lowermost portion thereof about a pivot axis located below the plane of said

supporting surface, said quadrant member having generally arcuate convex peripheral surface portions movable circumferentially of said pivot axis adjoining shoulder formations defining an intercept surface in the path of advancing movement of said carriage from the parked position and a stop shoulder engageable with said control leg to latch the quadarant member in a blocking position restraining the carriage in said parking position, means moving the control leg from latching abutment with said stop shoulder responsive to adjustment of the toothed racks to new settings, and means positioned to be activated by movement of said carriage during a pre-imprinting part of its advance stroke to insert said blade into said centering notches of each rack for precisely aligning the print wheels to insure proper fine adjustment registration of the imprinting numbers at the printing positions.

4,393,769

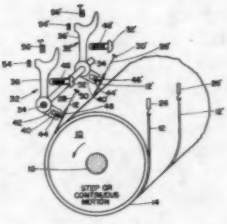
ELECTROSTATIC CLUTCH-OPERATED PRINTING MECHANISM

Alfred J. Landon, Peekskill; William B. Pennebaker, Carmel, and Han C. Wang, Chappaqua, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,864

Int. Cl.³ B41J *9/10, 9/32, 9/36*

U.S. Cl. 101—93.3 **2 Claims**



1. A printing mechanism, comprising:

a. an electrostatic clutch assembly, including a rotatively mounted semiconductive drum, and a conductive band wrapped around the periphery of said drum such that the application of a voltage pulse across said drum and band generates an electrostatic force therebetween, and means for rotating said drum;

b. a printing hammer rotationally mounted on a hammer shaft, and having a first arm extending from said hammer shaft and having a hammer head, said hammer head causing a printing operation during rotational movement of the printing hammer about said shaft in a first direction, said printing hammer also having a second arm extending from said hammer shaft in a direction substantially opposite to that of said first arm, said second arm defining an elongated slot along its length, and a pin being mounted in said slot and further being coupled to said band for movement therewith; and

c. a spring means for actuating said printing hammer, said spring means being mechanically coupled to said band through said printing hammer which is pulled to a cocked position, against the compressive action of said spring, by said band during the application of a voltage pulse across said electrostatic clutch while said drum is rotating, said printing hammer being actuated by the cocked spring at the termination of the voltage pulse which releases the spring, and said spring means compressively bearing against said first arm during rotation of said first arm in a direction counter to said first direction.

4,393,770

PRINTER WITH PRINTING DRUM

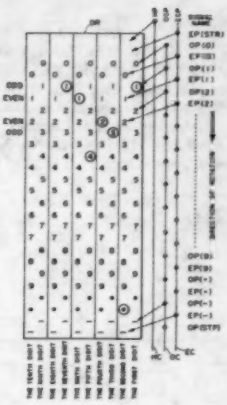
Hiroshi Takahashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of, Japan

Filed Sep. 1, 1981, Ser. No. 298,467

Claims priority, application Japan, Sep. 8, 1980, 55-124988

Int. Cl.³ B41J *1/44*

U.S. Cl. 101—93.22 **2 Claims**



1. A printer comprising:

a printing drum comprising a group of odd digit types and a group of even digit types, said odd digit types and said even digit types being disposed so as to come into a printing position alternately;

means for generating timing a pulse for indicating the position of said odd digit type on said drum;

means for generating a timing pulse for indicating the position of said even digit type on said drum;

means for stopping said drum when any selected type or said drum comes into the print position; and

means for carrying out printing following a predetermined time measured from detection of a timing pulse of even digit type which is positioned just before an odd digit type when the odd digit type is to be printed, and for carrying out printing following the predetermined time measured from detection of a timing pulse of odd digit which is positioned just before an even digit when the even digit is to be printed.

4,393,771

PRINTING HEAD FOR A PRINTER

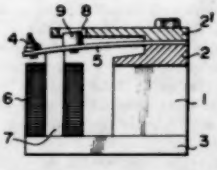
Juichi Tatsumi, Iruma, Japan, assignor to Ye Data Inc., Tokyo, Japan

Filed Nov. 24, 1981, Ser. No. 324,637

Claims priority, application Japan, Nov. 25, 1980, 55-167504[U]

Int. Cl.³ B41J *9/02*

U.S. Cl. 101—93.48 **2 Claims**



1. In permanent magnet type printing head for an impact dot

printer wherein a plate spring hammer has a hammer tip provided on one side thereof, and an attracting magnetic pole provided with a releasing electromagnetic coil arranged on another side opposite said hammer, the improvement comprising an armature disposed on the side where said hammer tip of said plate spring hammer is provided, and a yoke formed with a through hole or notch within which said armature is movable, said attracting magnetic pole being arranged between said hammer tip and said armature.

4,393,772

ROTARY PRINTING MACHINE, PARTICULARLY NEWSPAPER-TYPE OFFSET PRINTING MACHINE

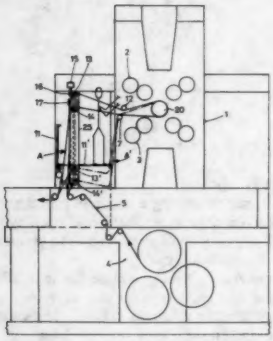
Rainer Burger, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,319

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034670

Int. Cl.³ B41F *7/02*

U.S. Cl. 101—217 **13 Claims**



1. Rotary printing machine having

a printing station (**1, 2, 3**);

two vertically staggered guide rollers (**13, 14**), one being associated with a section of a paper web (**5**) being supplied to a printing cylinder (**20**) of the printing station, and the other being associated with a section of the paper web being removed from the printing station,

said guide rollers guiding the paper web in a guide path having a portion extending essentially in vertical direction (**A, A'**), a portion extending in essentially horizontal direction for guidance of the paper web with respect to the printing cylinder of the printing station, the portion extending in essentially horizontal direction being sufficiently long to space the essentially vertical portion of the path from the printing station by a distance sufficient to render the printing station accessible to an operator;

vertically movable positioning means (**15, 16, 17**) coupled to the two guide rollers and selectively positioning the two guide rolers with respect to the printing station to change the relative position of the essentially horizontal portion and the essentially vertical portion of the guide path of the web (**5**) with respect to the printing station;

a pivotable operator platform (**11**) selectively horizontally positionable above the horizontal portion of the web path when the essentially vertical portion of the web is adjacent the printing cylinder, and the horizontal portion is remote from the printing cylinder, and separated therefrom by the essentialy vertical portion (**A'**), and pivotable to a vertical position about a pivot axis located remote from the vertical portion of the web when the vertical portion of the web is adjacent the printing station; and guide means (**25**) guiding movement of the two guide rollers (**13, 14**) between an upper and a lower position in which, respectively,

when the guide rollers are in the upper position, the horizontally extending portion of the web is in essential alignment with the printing cylinder, and thereby spacing the portion extending in vertical direction from the printing cylinder by the horizontally extending portion, and,

when the guide rollers are in the lower position, the horizontally extending portion of the web is positioned below the pivot axis of the pivotable operator platform.

4,393,773

ROTARY SHEET PRINTING MACHINE WITH TRANSPORT CHAIN

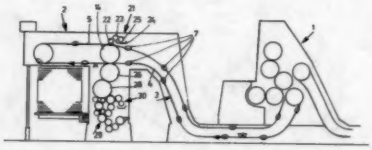
Klaus Theilacker, Friedberg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach Am Main, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,067

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114076

Int. Cl.³ B41F *21/06*

U.S. Cl. 101—232 **15 Claims**



1. Rotary sheet printing machine having

a printing station (**1**) and a receiving station (**2**);

a transport chain system (**3**) to transport sheets from the printing station to the receiving station including an endless transport chain (**6**) forming a supply run (**4**) and a return run (**5**) and having grippers (**13**) located thereon;

means (**21**) applying a liquid to at least the upper side of the sheet being transported by the chain system including

a liquid application cylinder (**14**) located between the supply run and the return run of the chain formed with an axial groove (**15**) in its circumference,

and a counter cylinder (**26**) located for surface engagement with the liquid application cylinder opposite the supply run of the chain

wherein, in accordance with the invention

the axial groove in the liquid application cylinder (**14**) is dimensioned to receive the entirety of the grippers (**13**) of the transport chain (**6**);

supply chain guide means (**17, 19**) are provided guiding the chain with respect to the liquid application cylinder such that a gripping surface (**9, 27**) of the grippers is tangent to the liquid application cylinder;

and return chain guide means (**18, 20**) are provided guiding the chain with respect to the liquid application cylinder such that the grippers (**13**) are wholly received in the groove (**15**) to permit application of a liquid to the liquid application cylinder at the side thereof engaged by the return run of the chain.

4,393,774

APPARATUS FOR PRINTING AND DISPENSING LABELS

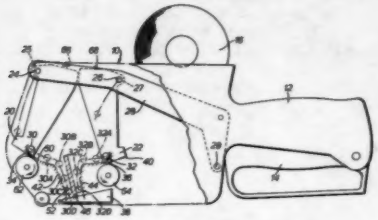
Anthony V. J. Figg, Kirby Cross, England, assignor to Norprint International, Boston, England

Continuation-in-part of Ser. No. 114,686, May 23, 1979, abandoned. This application Sep. 29, 1981, Ser. No. 306,853

Claims priority, application United Kingdom, May 23, 1978, 21428/78

Int. Cl.³ B41K 5/02, 1/08

U.S. Cl. 101—288 5 Claims



1. In apparatus for printing and dispensing labels, at a printing station having a printing surface,

a body,

a print-head assembly supported within the body, having a row of operative print facets, and being operative to produce a print impression on a label during each operating cycle of the apparatus, said cycle extending in a forward direction from a rest configuration of the apparatus to a printing station configuration and return to the rest configuration,

lever means pivotally mounting the print-head assembly in the body,

means biasing the lever means to the rest configuration in the operating cycle,

means pivotally mounting the print-head assembly on said lever means at a location on the lever means remote from the point of pivoting of the lever means on the body and also remote from the operative print facets,

means for actuating the lever means to bring the print-head assembly and the operative print facets thereof to the printing station during each operating cycle, and

cam means, including track means controlling the angular orientation of the print head assembly during part of the pivotal motion of the lever means relative to the body and of the print head assembly relative to the lever means, said track means comprising a first track portion that extends from the rest configuration of the print head assembly, and a second track portion that extends from the first track portion towards the configuration at the print station

a follower spigot on the print-head assembly disposed at the end of the print head assembly remote from the pivot mounting thereof,

an inking roller assembly having an inking roller,

said inking roller being operative during the forward portion of the operating cycle to ink the operative print facets and to guide the print-head assembly along its path towards said printing station,

the first track portion also being effective, in the absense of the inking roller, to guide the print-head assembly along a path towards the printing station,

first said track portion and also the inking roller being ineffective to guide the print-head assembly over the corresponding return portion of the return stroke of the operating cycle under the action of the biasing means so that irrespective of the presence of the inking roller, no further inking of the operative print facets can occur,

the second track portion being operative at said printing station in conjunction with the follower spigot positively to constrain the print-head assembly against motion in the plane of the operative print facets thereby to avoid a blurred impression and,

the pivot point of the print-head assembly on the lever means being offset substantially from an imaginary plane passing through the operative row of print facets at the printing surface and extending normally to the plane of the row of print facets.

4,393,775

ARRANGEMENT FOR METERING THE INK QUANTITY IN INKING UNITS ON PRINTING PRESSES

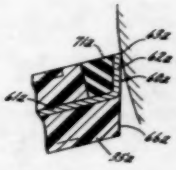
Bert Cappel; Gunther Schniggenfittig, both of Mulhein, and Siegfried Schuhmann, Offenbach am Main, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 3, 1981, Ser. No. 289,365

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1980, 3030774

Int. Cl.³ B41F 31/02, 1/46

U.S. Cl. 101—365 5 Claims



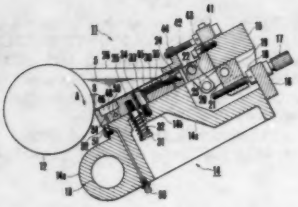
1. In an ink fountain combination comprising a frame defining a generally horizontal slot having parallel walls, a fountain roller rotatable in the frame adjacent the slot and having means for slowly driving the same, a metering assembly mounted in the slot and having a presented front edge arranged in abutting relation to the surface of the roller, the frame being shaped to support a body of ink adjacent the metering assembly so that a film of ink is formed on the roller by the assembly as the roller is rotated, the metering assembly being in the form of a series of flat slides fitted in the slot and arranged side by side in coplanar relation with their lateral edge lying closely adjacent one another so that the preferred front edge is substantially continuous, means at the rear ends of the respective slides for individually adjusting the position of each slide with respect to the fountain roller thereby to meter ink in predetermined thickness in respective zones upon the foundation roller, the front portion of each slide having embedded therein a blade of wear-resistant spring metal, each said slide having a tip portion formed of a generally rectangular piece of resilient material, the tip portion of each slide being relieved in the region just behind the blade to accomodate rearward flexing movement of the blade, such relief being provided by a transverse groove substantially filled with a yieldable strip of soft material flush with the top surface of the groove such that each slide presents only planar surfaces free of nooks and crannies behind the blade, the blade being coextensive with the width of the slide and so oriented in the slide as to present a flat face to the fountain roller defining with the fountain roller a sharply acute cusp faced in such direction that the surface of the roller moves out of the cusp so that (a) when the slide is slightly retracted from the fountain roller in a metering mode a gap is created for the feeding of a film or ink on the roller surface at a metered rate which depends upon the degree of retraction and so that (b) when the slide is advanced to close the gap in a sealing mode the edge of the blade bears against the surface of the fountain roller flexing broadwise resiliently and accommodatingly to achieve a seal between the blade and the fountain roller with only a limited reaction force being exerted between them.

4,393,776

INK FOUNTAIN DEVICE FOR USE IN PRINTING PRESS

Hideaki Toyoda, Tokyo, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1981, Ser. No. 292,304
Claims priority, application Japan, Feb. 20, 1981, 56-24760
Int. Cl.³ B41F *31/04, 31/06*
U.S. Cl. 101—365 9 Claims



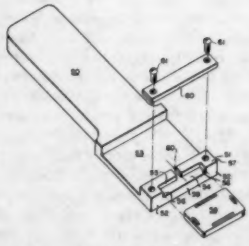
1. An ink fountain device for use in a printing press having an ink fountain containing printing ink, said ink fountain comprising an inking roller immersed in said printing ink contained in said ink fountain; a blade support; a plurality of blade sections juxtaposed on said blade support along the length of said inking roller, each of said blade sections being spaced an independent predetermined distance from the periphery of said inking roller; independent gap adjustment means for each of said blade sections for independently adjusting said predetermined distance between said blade section and the periphery of said inking roller; a thin magnetic plate extended over all of said blade sections, said thin magnetic plate having substantially the same width as the combined width of said blade sections; and a permanent magnet associated with each of said blade sections beneath said thin magnetic plate for attracting said magnetic plate to each of said blade sections.

4,393,777

HOLDING FIXTURE FOR A HOT STAMPING PRESS

Raymond P. Harris, Baltimore, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 16, 1981, Ser. No. 225,499
Int. Cl.³ B41F *21/00*
U.S. Cl. 101—407 BP 3 Claims



1. A fixture for holding a flat, stiff workpiece for contact with a stamp head, comprising:

a unitary member having a generally elongate shape providing a hand graspable section (**50**) and a planar, distal terminal section (**51**);

a narrow and elongate slot (**54**) formed in said planar, distal terminal section having a bottom surface, a rear surface, and at least one side wall said slot being open to the end and top surfaces of said terminal section; and

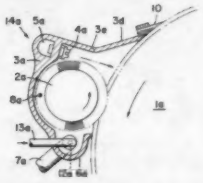
an elongate cover (**60**) having a flat underside detachably secured to said top surface of said terminal section and forming with said bottom surface, rear surface and said side wall of said slot a continuous force-fit receptacle for a terminal segment of a flat workpiece having a thickness substantially equal to the separation between said underside of said cover and said bottom wall of said slot.

4,393,778

DEVICE FOR WASHING BLANKET CYLINDER OF ROTARY OFFSET PRESS

Toshihisa Kaneko, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1981, Ser. No. 283,440
Int. Cl.³ B41F *35/06;* B41L *41/06*
U.S. Cl. 101—425 5 Claims



1. In a device for washing a blanket cylinder of a rotary offset press, which device comprises a brush roll disposed on a lateral side of the blanket cylinder for rotation about an axis parallel to the axis of the blanket cylinder, in the same rotational direction as the blanket cylinder, and in pressed state in a region of contact against the blanket cylinder, the rotational direction of the brush roll being such that the peripheral surface thereof in said region of contact moves upward, spraying means disposed above the brush roll for spraying a wash liquid against the blanket cylinder at a part thereof in front of the region of contact as viewed in the rotational direction of the blanket cylinder, and a housing enclosing the brush roll and the spray means, functioning to prevent the washing liquid from scattering undesirably to other parts of the press, and having a trough at the bottom thereof for collecting waste washing liquid and washed-off foreign matter, said housing having a ceiling plate having a bent portion from which the ceiling plate extends obliquely upward with an eave-like shape toward an edge in close proximity of the blanket cylinder, said bent portion being the lowest portion of the ceiling plate and located above the brush roll whereby droplets of the washing liquid slung upward against the ceiling plate flow downward therealong toward said bent portion to drip onto the brush roll and not onto the blanket roll.

4,393,779

ELECTRIC DETONATOR ELEMENT

Uwe Brede, and Horst Penner, both of Fürth, Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

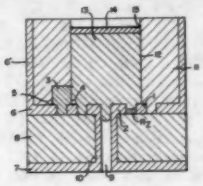
Continuation of Ser. No. 948,782, Oct. 5, 1978, abandoned. This application Jul. 23, 1980, Ser. No. 171,293
Claims priority, appliration Fed. Rep. of Germany, Oct. 20, 1977, 2747163
Int. Cl.³ F42B *5/08*
U.S. Cl. 102—202.5 12 Claims

1. An electrical detonator element comprising:

a support of an electrically nonconductive material;

an electric circuit provided on the support for enabling detonation, the electric circuit including an ignition resistance with lead electrodes connected thereto and at least one electronic component means, the ignition resistance and the at least one electronic component means being electrically connected in the electrical circuit and each being separately arranged on the support; and

a mechanically firm insulating member contacting the support so as to at least partially cover the at least one electronic component means, the at least one electronic component means being embedded in the insulating member, the insulating member being provided with a recess in the region of the ignition resistance which exposes at least the ignition resistance, the recess extending through the insulating member and being adapted for receiving a primer charge in operative connection with the ignition resistance.

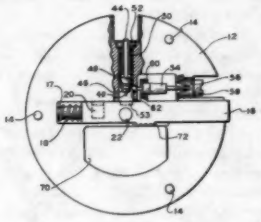


4,393,780

OMNI DIRECTIONAL FUZE

Alexey T. Zacharin, Parsippany, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 17, 1981, Ser. No. 293,739
Int. Cl.³ F42C *1/06, 9/02*; F42B *23/26*
U.S. Cl. 102—255 **13 Claims**



1. A fuze comprising:
a frame;
a firing pin slidably mounted in said frame;
a slider supporting a detonator, for moving said detonator into alignment with said pin;
an impact sensor for engaging and restraining said pin, said sensor being pivotally mounted in said frame;
said slider having a safe position and having an arm sized to hold said sensor when said slider is in said safe position, said sensor being free to pivot and to disengage said pin in response to deceleration of said frame in excess of a predetermined magnitude when said slider has moved said detonator into alignment with said pin.

4,393,781

FUZE FOR LIQUID SHELL PROPELLANTS

Manfred Graf, Düsseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 26, 1973, Ser. No. 337,093
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1972, 2217728
Int. Cl.³ F42B *5/16, 9/14*
U.S. Cl. 102—440 **2 Claims**

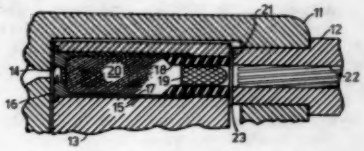
1. A fuze for firing a projectile from a gun barrel, comprising:
a pyrotechnical detonator disposed at the aft end of a projectile to be fired, said detonator having a diameter less than the caliber of said projectile;
a breech piece secured to the rear end of the gun barrel and defining therewith a charge chamber centered on an axis;
positioning means for emplacing said projectile in said gun barrel with said detonator extending rearwardly into said charge chamber along said axis, said breech piece being provided with at least one conduit opening tangentially into said charge chamber for injecting a liquid propellant into same with circulatory motion around said detonator; and
igniting means for setting off said detonator in the presence of the circulating propellant.

4,393,782

REVOLVING FIREARMS AND AMMUNITION THEREFOR

Charles R. Olsen, 307 Conestoga Way, Eagleville, Pa. 19408

Filed Sep. 16, 1980, Ser. No. 187,772
Int. Cl.³ F42B *5/02*
U.S. Cl. 102—446 **17 Claims**



1. A firearm special cartridge for use in the cylinder of a revolving cylinder firearm of the type having a barrel in front of the cylinder and in which the cylinder has a plurality of axially extending chambers each having an open mouth, said cartridge comprising in combination,
(a) a cartridge case having a closed head and an open mouth, the said cartridge case open mouth being spaced rearward of the revolver cylinder chamber mouth when the cartridge is installed in a revolver cylinder chamber,
(b) a generally cylindrical adapter member made of resiliently deformable material having a passage open at both ends extending therethrough from one end to the other along the cylindrical axis and having an external diameter at least at the rear end which fits closely within the mouth of the cartridge case, said adapter front end extending substantially to the mouth of the revolver cylinder chamber when the cartridge is installed in a revolver cylinder, the rear end of said adapter being formed to be radially expandible under gas pressure formed within the cartridge case upon firing of the cartridge to peripherally seal the outside surface of the adapter against the inside surface of the cartridge case and minimize escape of propellant gas between the said adapter and cartridge case,
(c) means securing said adapter within said cartridge case, and
(d) a bullet disposed close-fittingly within the open passage through said adapter and closing the open cross-sectional area thereof,
whereby, when the cartridge is fired the expanding gas drives the resilient adapter forward so that its front end strikes the rear face of the firearm barrel to seal the cylinder-to-barrel gap and prevent the escape of propellant gas except through the barrel muzzle, and thereafter when the bullet exits the barrel

muzzle the reduction of gas pressure to ambient permits longitudinal retraction of the resilient adapter and frees the cylinder for rotation.

4,393,783

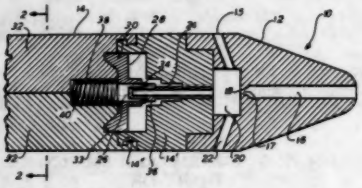
FLUIDIC RANGE-SAFE EXPLOSIVE DEVICE

Michael J. Goes, Mine Hill; John R. Masly, Landing, and Albertus E. Schmidlin, Caldwell, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 126,802, Mar. 3, 1980, Pat. No. 4,334,478. This application Nov. 2, 1981, Ser. No. 317,049

Int. Cl.³ F42B 9/20

U.S. Cl. 102—529 **3 Claims**



1. Fluidic range safe device which comprises;

a projectile having a leading nose portion and a generally cylindrical body portion located therebehind, said body portion including;

at least two complementary longitudinal segments adjacently disposed to form a cylindrically shaped body assembly, said body assembly having a plurality of cylindrical recesses axially located therein and a tongue-in-groove end;

a cylindrical forward body portion operatively disposed intermediate said longitudinal segments and said nose portion, said forward body portion snapfittably engaging said tongue-in-groove end of said longitudinal segments and to said nose portion;

means for thermally inducing disintegration of said body portion of said projectile further comprising;

a nozzle element axially disposed in said nose portion, said nozzle element tapering to a reduced diameter orifice;

an air vent assembly communicating with said orifice, said air vent assembly comprising an air collection chamber and air escape channels radiating therefrom;

temperature responsive fragmentation means located in said forward body portion in fluid registry with said air vent assembly, said fragmentation means adapted to respond to elevated temperature to cause said body portion to disintegrate which includes;

temperature transmitter means disposed within said body, said temperature transmitter adapted to absorb and transmit thermal energy, said transmitter means includes a temperature absorptive tube having an open end communicating with said air collection chamber, and an opposed closed end; and

fragmentation promoter means, disposed in registry with said closed end of said temperature absorptive tube, for overcoming the cohesive forces maintaining the integrity of said body portion; said promoter means includes;

retainer means comprising a spider member for releasably holding said longitudinal segments and said forward body portions together during projectile launch and flight, and for mechanically allowing said longitudinal segments to separate from said forward body portion after said projectile has traveled a specified distance down range; and

said release means comprises a movable cutter ram disposed at one end thereof in axial abutment against said retainer, and a thermally actuated explosive charge located between the opposite end of said cutter ram and the closed end of said temperature absorptive tube, whereby the detonation of said explosive charge forces said cutter ram to impinge upon said retainer to cut said retainer and to force said retainer to release said longitudinal segments.

4,393,784

APPARATUS FOR REPLACING RAIL FASTENING ELEMENTS AND, OPTIONALLY, RAILS

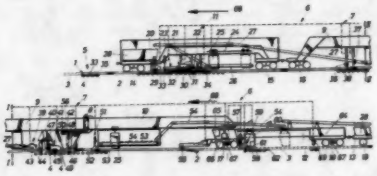
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Continuation of Ser. No. 149,159, May 14, 1980, abandoned, which is a continuation of Ser. No. 902,853, May 4, 1978, abandoned. This application Dec. 18, 1981, Ser. No. 332,303

Claims priority, application Austria, May 6, 1977, 3255/77

Int. Cl.³ E01B 29/20, 31/26, 31/22

U.S. Cl. 104—2 **7 Claims**



1. An apparatus for replacing track rails fixed to ties with old rail fastening elements at a predetermined track gauge by track rails fixed to the ties with new rail fastening elements at said gauge, which comprises

(a) a train of a plurality of track-bound cars mounted for mobility along the track rails at said gauge in an operating direction and one of the cars being a carrier frame comprising

(1) two pivotal frame parts and

(2) a pivoting axle extending substantially perpendicularly to a plane defined by the track rails and interconnecting the pivotal frame parts for pivotal movement with respect to each other,

(b) an assembly line of a series of individual operating mechanisms arranged spacedly and sequentially on the track-bound cars, each of the operating mechanisms including vertically movable tools mounted on the cars and centered over their work, the assembly line comprising, in sequence,

(1) a first one of the individual operating mechanisms including tools for detaching the old rail fastening elements from the ties, the removed rail fastening elements leaving holes in the ties,

(2) another one of the individual operating mechanisms for lifting the rails at gauge and for spreading the lifted rails beyond the track gauge, the first and other operating mechanisms being arranged on a forward one of the frame parts, as seen in the operating direction,

(3) means for working on the ties mounted on the carrier frame, the tie working means including an operating mechanism for plugging the holes in the ties and an operating mechanism for adzing the ties,

(4) an additional one of the individual operating mechanisms for placing the track rails on the plugged and adzed ties at said gauge,

(5) a further one of the individual operating mechanisms including tools for applying the new rail fastening elements to fix the track rails to the plugged and adzed ties, the additional and further operating mechanisms being arranged on a rear one of the frame parts, as seen in the operating direction, and

(6) respective tie holding devices associated with the tie working means and the first operating mechanism.

4,393,785

SUSPENDED TRACK FOR MONORAIL SUSPENDED TROLLEYS

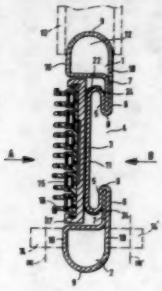
Franz Hörtnagel, Oberperfuss, Austria, assignor to Firma R. Stahl GmbH & Co., Stuttgart-Wangen, Fed. Rep. of Germany

Filed Mar. 25, 1981, Ser. No. 247,524

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019301

Int. Cl.³ E01B 25/22

U.S. Cl. 104—110 20 Claims



1. Suspended track for monorail suspended trolleys having an upper hollow structural section (1);
a lower hollow structural sections (2);
and a connecting web (3) connecting said upper and lower sections together, adapted to be supported by hanger elements (25) laterally attachable to said web, and further being adapted to support electrical connection tracks, buses or rails (15),
said connecting web being a unitary element integral with the upper and lower hollow structural section and defining a central portion, and mutually approaching end portions leaving, between the ends (8) thereof, an open space;
and wherein, in accordance with the invention,
the central portion of the generally C-cross-sectionally shaped connecting web forms a back portion (11);
the end portions of said web extend forwardly from the back portion, converging towards each other and leaving, between the ends (8) thereof, a groove-like open gap (4) which defines said space;
and mutually diverging wing portions (6) are provided extending upwardly and downwardly away from said gap (4), said wing portions merging into said upper and lower hollow structural sections (1, 2) and extending to form upper and lower hollow structural portions, respectively, of said sections.

4,393,786

TRACK CROSSING FOR A TWO TRACK SUSPENSION RAILROAD

Hans J. Düll, Langensendelbach, and Adolf Hillmer, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 5, 1980, Ser. No. 213,674

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2950017

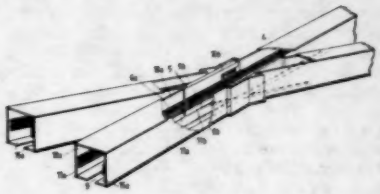
Int. Cl.³ E01B 25/12

U.S. Cl. 104—141 5 Claims

1. In a track crossing for a carriage of a two-track suspension railroad arranged in a track girder, in which running surfaces for support wheels are provided on both sides of a slot provided in the track girder, through which a suspension connecting the carriage to a cabin passes, the improvement comprising:

(a) the track girder being a box girder, at the sidewalls of which parallel guide surfaces for lateral guide wheels and current rails are arranged,

(b) two settable support members having lateral guide surfaces for bridging the unused track pivoted for swinging motion at the mutually opposite sidewalls of the crossing track girders about vertical axes;



(c) depressions in the sidewalls of the box girders in the one or the other track into which said support members can be swung; and

(d) current rails on at least one of said support members.

4,393,787

ROLLER SIDE BEARING MOUNTING SYSTEM AND METHOD

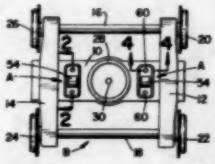
George M. Hess, Huron, and James A. Zils, North Royalton, both of Ohio, assignors to Russell, Burdsall & Ward Corporation, Cleveland, Ohio

Continuation of Ser. No. 135,480, Mar. 31, 1980, Pat. No. 4,323,015. This application Apr. 5, 1982, Ser. No. 365,881

The portion of the term of this patent subsequent to Apr. 6, 1999, has been disclaimed.

Int. Cl.³ F16B 5/02, 31/02

U.S. Cl. 105—199 CB 22 Claims



1. An arrangement for mounting a roller side bearing assembly to a rail car truck assembly, said arrangement comprising in combination:

a truck assembly including spaced wheels adapted to rollingly support said rail car on a pair of parallel spaced apart tracks, said assembly including a top surface portion;

a side roller bearing assembly having an elongated generally U-shaped bearing cage including a bottom wall and a pair of spaced apart generally parallel side walls upstanding therefrom, said bottom wall having at least a pair of spaced apart openings extending therethrough in registry with at least a pair of openings in said truck top surface portion, said bearing cage side walls having at least one cylindrical bearing member extending therebetween adapted to supportingly engage an area of said rail car for reducing frictional forces generated during swivel movement between said car and truck assembly;

an elongated threaded fastener extending through each of said pairs of registered bottom wall and top surface portion openings, said fasteners each having a head and an elongated shank threaded along at least the outermost end section thereof wherein said head and shank interface with each other at a distinct fillet area, said head cooperating with said bottom wall and said shank extending through an associated pair of registered bottom wall and top sur-

face portion openings with said threaded outermost end disposed in threaded engagement with retaining means disposed on the underside of said top surface portion, said threaded fasteners being placed in some desired clampload condition within predetermined upper and lower limits as a function of rotating said fasteners to secure threaded advancement thereof into said retaining means, said desired clampload being less than an amount which would cause failure in said bearing cage and greater than an amount which increases the potential for failure in said fasteners when said fasteners are subjected to tensile and bending loads resulting from loading of said roller side bearing assembly during rolling travel of said rail car along said track, said fasteners each further including means for limiting the torque applied thereto during fastener rotation into threaded advancement with said retaining means whereby the resultant fastener clamploads may not exceed said upper limit; and,

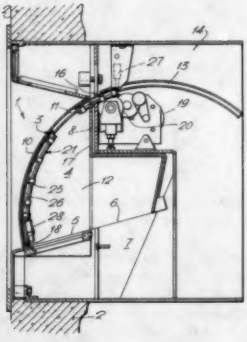
bearing means interposed between the head of each fastener and said bearing cage bottom wall to facilitate control of frictional forces occurring at said fastener heads during rotation thereof into threaded engagement with said retaining means, said bearing means further protecting the fillet areas of said fasteners from being imbedded by said bearing cage bottom wall at said bottom wall openings at least when said fasteners are subjected to tensile and bending loads.

4,393,788

RETRACTABLE PROTECTIVE-SCREENS AND EQUIPMENT INCLUDING THEM

Bernard F. Campbell, 95 Havelock Rd., and Leslie Vallance, 6 Hollingbury Copse, both of Brighton, East Sussex, England

Filed Jan. 30, 1981, Ser. No. 230,152
Int. Cl.³ E04N 9/00
U.S. Cl. 109—2 **13 Claims**



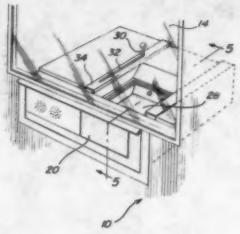
1. In equipment including a retractable protective-screen in the form of a member having two side-edges that are guided for movements of the member in extension and retraction of the screen, and drive means coupled to said member to drive it in at least one of said movements, the improvement wherein said drive means is coupled to said member to established driving engagement therewith via a rack-and-pinion coupling, said coupling comprising a rack carried by said member, said rack being an elongate strip of flexible material having projecting teeth formed integrally therewith, said strip being secured to said member at least at spaced positions along the length of the strip to extend on said member substantially centrally thereof intermediate said side-edges, and a pinion engaging with the teeth of the rack, said drive means being coupled to said pinion to rotate the pinion and thereby drive said member via said rack.

4,393,789

HIGH SECURITY TRANSACTION DRAWER

Herman E. Glotfelter, 4618 N. Post Rd., Indianapolis, Ind. 46226

Filed Jan. 26, 1981, Ser. No. 228,077
Int. Cl.³ E06B 7/32
U.S. Cl. 109—19 **9 Claims**



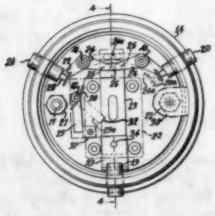
1. In combination with a partition structure having a horizontal drawer opening formed therethrough, a drawer structure defining an upwardly opening compartment, support means supporting said drawer structure from said partition for shifting of said drawer through said opening between first and second positions with said compartment opening upwardly on first and second sides of said partition, a security panel shiftably supported from said drawer for movement between closed and open positions closing and opening, respectively, said compartment from above, and security panel shifting means operatively connected between said panel and said support means for automatically shifting said panel to said open position responsive to said drawer being shifted to said first position, automatic shifting of said panel to said closed position responsive to initial shifting of said drawer from said first position toward said second position and automatic shifting of said panel back to said open position responsive to final movement of said drawer to said second position.

4,393,790

SAFE DOOR ASSEMBLY

William H. Bagwell, 1610 Country Club Prado, Coral Gables, Fla. 33134

Filed Jun. 10, 1981, Ser. No. 272,323
Int. Cl.³ E05G 1/04; E05B 63/00, 63/14, 15/16
U.S. Cl. 109—76 **25 Claims**



1. In a safe door assembly comprising a door casing, a door, a plurality of locking bolts operated by a combination lock so as to be selectively extended outwardly from or retracted inwardly into said door to lock or unlock, respectively, said door to said casing; said casing including a seat to accommodate a shoulder on said door and recess to receive each of said outwardly extended locking bolts; said door also including a combination lock with a retractable tongue operatively connected to a sliding link bar with lever means to simultaneously extend or retract said locking bolts; the improvement compris-

ing a pivotable relocking bar spring biased to pivot into a position whereby a portion of said bar mates with a corresponding portion in said link bar to prevent said link bar from sliding, said relocking bar positioned to mate with said link bar when said combination lock is disposed inwardly from its normal position; a hardened steel barrier separating the mechanism of said combination lock from the outside wall of said door; and a plurality of bolts through the outer wall of said door and through said hardened steel barrier fastened with lock nuts and supporting a handle for moving said door away from said casing, said bolts being weakened in their shank portions to shear off the head of the bolt if subjected to the torque normally required for unloosening said bolt from its lock nut.

4,393,791

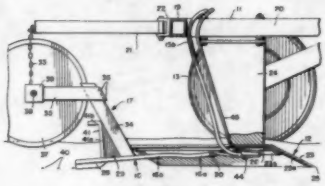
UNDERCUTTER SEED PLANTER

Donald A. Suderman, Manhattan, Kans., assignor to Kansas State University Research Foundation, Manhattan, Kans.

Filed Jan. 16, 1981, Ser. No. 225,469

Int. Cl.³ A01C *5/06, 7/20*

U.S. Cl. 111—34 **5 Claims**



1. A seed planting apparatus comprising an undercutter plow having a blade with horizontal leading and trailing edges; transport means supporting said blade for substantially horizontal movement at a selected depth beneath a soil surface; an enlongated rigid seed delivery member connected to said blade and extending rearwardly from the trailing edge thereof for longitudinal movement beneath a soil surface behind said blade; said seed delivery member having a front portion and an elongated rear portion; said front portion being hingedly connected to said blade for horizontal and vertical movement of said rear portion with respect to said blade; said rear portion being tubular and rearwardly terminating in a trailing end having a seed discharge opening for releasing seeds into the soil beneath the surface thereof; said seed delivery member communicating with seed metering means adapted to supply seeds in a flowing air stream thereto for the release of seeds into the soil from said discharge opening; and a gage wheel assembly secured to said rear portion of said seed delivery member adjacent said trailing end; said gage wheel assembly including a stanchion secured to said seed delivery member adjacent said rear portion, a mounting member adjustably secured to said stanchion for movement into different selected positions of vertical adjustment therealong, and a pair of wheels rotatably mounted upon and disposed on opposite sides of said mounting member above and behind said trailing end of said seed delivery member; said seed delivery member being provided adjacent said trailing end with an upstanding air release tube for releasing air from said rear portion at a point spaced forwardly from said discharge opening; said air release tube having an outlet spaced above said seed delivery member a distance substantially greater than the depths of the soil at which said trailing end is adapted to be supported by said gage wheel assembly; said assembly being adapted to support said trailing end of said seed delivery member at a selected depth totally beneath the surface of the soil, with said seed delivery member forming a tunnel beneath the surface for receiving seeds from said discharge opening, when said apparatus is in operation; said trailing end of said seed delivery member having a depending longitudinal flange for firming the soil within said tunnel.

4,393,792

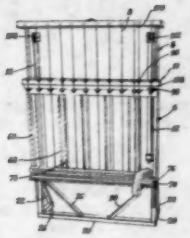
APPARATUS FOR MATTRESS MANUFACTURE

Albert R. St. Clair, Hamilton, Ohio, assignor to Simmons U.S.A. Corporation, Atlanta, Ga.

Filed May 29, 1981, Ser. No. 268,271

Int. Cl.³ D05B *11/00*

U.S. Cl. 112—3 R **6 Claims**



1. A mattress core manufacturing apparatus for making a core unit out of an assembly of coiled wire springs having a pair of spaced end coils representing the top and bottom faces of the assembly, the apparatus comprising:

a frame;

a support for holding said assembly, said support mounted on the frame for reciprocal movement relative to said frame;

a plurality of needles mounted on said frame, said needles being thrust through said assembly between said top and bottom faces thereof upon reciprocation of said support relative said frame;

an intermediate needle guide assembly mounted on said frame spaced from said support for reciprocal movement relative to said frame;

a drive means operatively attached to said support for reciprocal movement thereof;

a plurality of needle guide bushings mounted on said support and intermediate needle guide assembly; and

said needle guide bushings including a bushing surface for said needles to prevent said needles from bending as the support reciprocates relative to said frame and said needles are thrust through the assembly held by said support.

4,393,793

TUFTING MACHINE WITH ADJUSTABLE YARN GUIDE TUBE BANK

Max M. Beasley, Chattanooga, Tenn., assignor to Tufco Corporation, Chattanooga, Tenn.

Filed Feb. 1, 1982, Ser. No. 344,376

Int. Cl.³ D05C *15/18*

U.S. Cl. 112—79 R **9 Claims**

1. In a tufting machine having means for supporting a base fabric for longitudinal movement in a feeding direction from front to rear through said machine, a plurality of transversely spaced reciprocal needles for introducing yarns through the base fabric to form loops, a yarn jerker bar reciprocably moving with the needles, yarn guide means comprising:

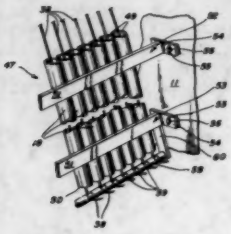
(a) a yarn tube bank including a plurality of yarn guide tubes having upper and lower open ends,

(b) mounting means supporting said yarn tube bank on the machine above the base fabric,

(c) said yarn tube bank comprising a yarn jerker member spanning the lower ends of said yarn guide tubes,

(d) each of said yarn guide tubes receiving a yarn from a yarn supply through its upper end and guiding said yarn through said corresponding yarn guide tube, and across

said yarn jerker member and the yarn jerker bar to a corresponding needle, and



(e) adjustment means for vertically adjusting the position of said yarn jerker member on said machine relative to said needles.

4,393,794

SEWING MACHINE WITH NEEDLE DROPPING HOLE CHANGING CONTROL DEVICE

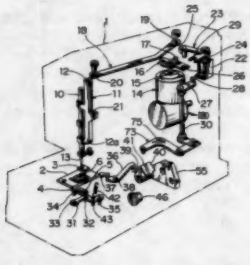
Yasukata Eguchi, Kunitachi; Hideaki Takenoya, and Yasuro Sano, both of Hachioji, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Oct. 23, 1980, Ser. No. 199,914

Claims priority, application Japan, Nov. 5, 1979, 54-152423[U]

Int. Cl.³ D05B *1/14, 3/02, 75/00*

U.S. Cl. 112—158 E **1 Claim**



1. A sewing machine having a pulse motor operatively connected to a needle of the sewing machine to control the needle position and selectively operated to change the position of the needle and exchange a laterally elongated needle dropping hole for a reduced circular dropping hole and vice versa in dependence upon the stitching type, said needle plate being provided with an auxiliary needle plate which is formed with the reduced circular needle dropping hole and is selectively displaced by a transmission linkage to a position in which the auxiliary needle plate covers the laterally elongated needle dropping hole of the needle plate to provide the reduced circular needle dropping hole and to a position in which the auxiliary needle plate is spaced from the laterally elongated needle dropping hole of the needle plate, comprising operating means movable between a first and second predetermined positions, clutch means normally connected to the operating means and selectively operated to connect the pulse motor to the operating means when the pulse motor is driven to a predetermined angular position displacing the needle to a predetermined position, control means operatively connected to the operating means and to the transmission means, said control means including a cam member displaced to a predetermined position by a drive force of the pulse motor through the operating means, a follower member engaging the cam member, said cam member being rotated by a starting drive of the sewing machine to displace the follower member to a predetermined set position, thereby to displace the auxiliary needle plate relative to the needle plate through the transmission means, and means for holding the follower member in the set position.

4,393,795

ELECTRONIC SEWING MACHINE

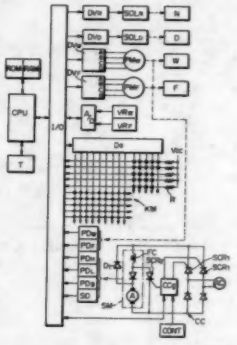
Hachiro Makabe, Fussa; Kazuo Watanabe; Hideaki Takenoya, both of Hachioji; Toshiaki Kume, Tachikawa, and Toshihide Kakinuma, Tokyo, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 96,573, Nov. 21, 1979, abandoned. This application May 8, 1981, Ser. No. 261,710

Claims priority, application Japan, Nov. 27, 1978, 53-145280

Int. Cl.³ D05B *3/02*

U.S. Cl. 112—158 E **2 Claims**

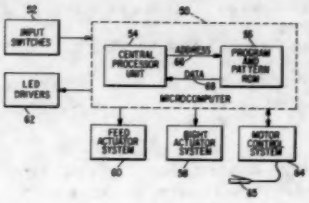


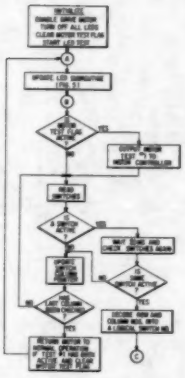
1. A sewing machine having an electric machine motor driven by a manually operated controller, stitch forming instrumentalities including a needle driven by the machine motor to vertically reciprocate so as to penetrate a fabric to be sewn and a fabric feeding device driven by the machine motor in synchronism with the needle to feed the fabric relative to the movement of the needle, fabric presser means manually adjusted to press the fabric against the needle plate at a set pressure, and electronic memory means storing stitch data sequentially read out to control the needle position and the fabric feeding position, comprising electromagnetic drive means (PMw) operated by the stitch data of the memory means to control the needle position; another electromagnetic drive means (PM_F) operated by the stitch data of the memory means to control the fabric feeding position; means manually operated to adjust the fabric presser means to press the fabric with a suitable pressure for basting stitches and generating an electric signal at a predetermined set position; control circuit means (CC) activated by operation of the controller to drive the machine motor at a reduced speed and to stop the machine motor after one complete rotation thereof with the needle stopped at the upper dead point thereof; switching means operated by one of the electromagnetic means to make the fabric feeding device inoperative; and data processing means (CPU) detecting the electric signal of the fabric presser adjusting means to perform calculations and treatments of the results by means of the programing data stored in the memory, thereby to produce orders to operate the control circuit means and the switching means.

4,393,796
ARRANGEMENT FOR OPERATING AN ELECTRONICALLY CONTROLLED SEWING MACHINE IN A DIAGNOSTIC MODE

William H. Dunn, Frankford Township, Sussex County; Leonard I. Horey, West Orange, and Marvin Kurland, East Brunswick, all of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jun. 28, 1982, Ser. No. 393,148
Int. Cl.³ D05B 3/02, 79/00
U.S. Cl. 112—158 E 6 Claims





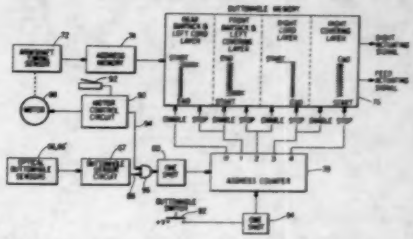
1. An electronically controlled multiple pattern sewing machine having operator controlled input means for selecting functions to be performed by said sewing machine, indicating means for providing an indication of the function selected by an operator via said input means, diagnostic means for operating said sewing machine in a diagnostic mode, said diagnostic means utilizing said indicating means for providing an indication to said operator of the operation of said sewing machine while in said diagnostic mode, and operator controlled means for selectively causing said diagnostic means to be operative.

4,393,797
ARRANGEMENT AND METHOD FOR PREVENTING FALSE TRIGGERING IN AN OPTICALLY SWITCHED BUTTONHOLE MECHANISM

Walter H. W. Marsh, Scotch Plains, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Dec. 13, 1982, Ser. No. 449,093
Int. Cl.³ D05B 3/06
U.S. Cl. 112—158 B 2 Claims

1. In an electronically controlled sewing machine having a controller, a controllable drive motor, and an optical buttonhole mechanism including photosensitive means responsive to changes in the amount of light impinging thereon for providing buttonhole signals adapted to be used by said controller for sequencing through states in the formation of a buttonhole pattern, the improvement comprising:

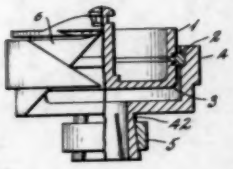


means enabled only during operation of said drive motor for transmitting said buttonhole signals to said controller.

4,393,798
ROTARY SHUTTLE FOR A SEWING MACHINE

Haw-Lin Cheng, No. 119, Chung Shan Rd., Taiwan, Taiwan

Filed Sep. 29, 1980, Ser. No. 191,537
Int. Cl.³ D05B 57/16, 71/02
U.S. Cl. 112—231 2 Claims



1. A rotary loop taker for a sewing machine comprising:
(a) an internal housing comprising an upper part and a lower part held together by a ring which forms a middle part of the internal housing;
(b) an external housing comprising a tail base over which can be fitted an internally tapered member for fitting the loop taker into a sewing machine; and
(c) a flexible piece fixed to the external housing, the external housing and flexible piece being free of screw holes and the ring having a Teflon coating so that the internal and external housings are rotatable relative to each other.

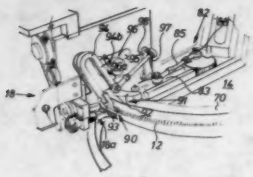
4,393,799
ATTACHMENT OF KNITTED FABRIC STRIP TO A PIECE OF FABRIC

Denis Matthews, Sutton-in-Ashfield, England, assignor to Mathbirk Limited, Sutton-in-Ashfield, England

Filed Oct. 16, 1980, Ser. No. 197,526
Claims priority, application United Kingdom, Oct. 20, 1979, 7936477; Fed. Rep. of Germany, Jan. 25, 1980, 8002667
Int. Cl.³ D05B 1/00
U.S. Cl. 112—262.1 9 Claims

1. A method of linking a fabric strip to a piece of fabric, the fabric strip having spaced longitudinal edges, comprising impaling the piece of fabric on the points of a linking machine and positioning the fabric strip on the points of the linking machine adjacent one of the longitudinal edges of the strip in a manner

whereby the second longitudinal edge of the strip is arranged to abut the points, gripping the fabrics by gripping means to



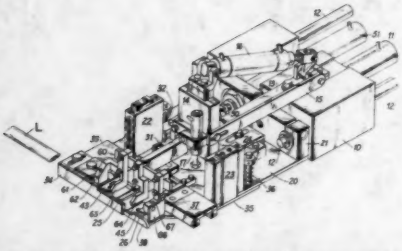
position them relative to each other preparatory to linking and then linking the two fabrics together by a sewing operation.

4,393,800

BELT LOOP FOLDER AND FEED APPARATUS

Francis B. Hargett, Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Sep. 10, 1981, Ser. No. 300,769
Int. Cl.³ D05B *3/12*
U.S. Cl. 112—265.1 **10 Claims**



1. Apparatus for folding and presenting a drop type belt loop for attachment to a garment, comprising

a base plate;

drop plate means connected to move vertically relative to said base plate and biased upwardly;

said drop plate means being provided with a laterally disposed receiver immediately forward of said base plate for belt loops moving endwise thereto;

folding means comprising a pair of laterally spaced stationary tongues connected to said base plate and extending across the bottom of said receiver, and a pair of folding tongues connected to said drop plate means and extending therefrom across said receiver;

said folding tongues being spaced upwardly and outwardly of said stationary tongues;

stabilizer means being provided with a pair of laterally spaced jaws extending across said receiver and being spaced vertically in alignment with said stationary tongues;

first means for moving said stabilizer means toward said receiver to clamp a belt loop during folding between said jaws and stationary tongues, and for moving said stabilizer means away from said receiver to release a folded belt loop;

second means for simultaneously moving said receiver and folding tongues downwardly relative to said stationary tongues and thereafter moving said folding tongues toward each other below said stationary tongues thereby folding the upper and lower loop ends under the belt loop between said stationary tongues with the upper loop end extending past the fold of the lower loop end;

one of said folding tongues being disposed in vertical alignment with one of said stationary tongues thereby clamping the folded loop ends therebetween; and

means for moving the stationary and folding tongues forwardly thereby moving a folded belt loop transversely to its length to a stitching station of a tacker for attachment to a garment.

8. A method of folding and presenting a drop type belt loop for attachment to a garment comprising the steps of

feeding a belt loop endwise to a position for folding;

clamping the belt loop in position only until folded;

underfolding both ends of the belt loop with the underfolded upper belt loop end extending past the fold of the lower belt loop end;

clamping the underfolded belt loop ends together thereby holding the belt loop and

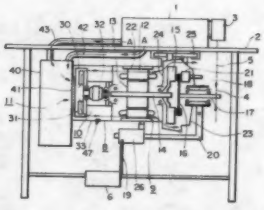
moving the folded belt loop transversely to its length for presenting the folded belt loop for attachment.

4,393,801

SEWING MACHINE DUST COLLECTOR

Masahisa Kato; Syouji Kasugai, and Osamu Gouda, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1982, Ser. No. 349,109
Claims priority, application Japan, Feb. 19, 1981, 56-23276
Int. Cl.³ D05B *71/00*
U.S. Cl. 112—282 **5 Claims**



1. A dust collector for use with a sewing machine comprising a clutch motor adapted to drive a sewing machine, suction means for collecting waste associated with the operation of said sewing machine including a blower motor, first control means for selectively energizing said blower motor in synchronization with the engagement of the clutch of said clutch motor and second control means adapted to selectively energize said blower motor independently of said first control means.

4,393,802

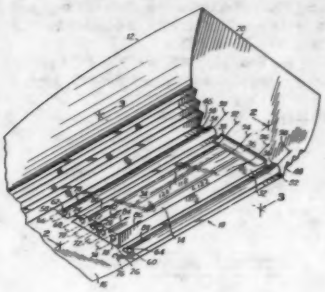
BOAT HULL WITH UNDERSIDE CHANNEL

Salvatore A. Rizzo, P.O. Box 87, E. Setauket, N.Y. 11733

Filed May 16, 1980, Ser. No. 150,338
Int. Cl.³ B63B *1/38*
U.S. Cl. 114—67 A **12 Claims**

1. A hull for a motor boat having an internal combustion propulsion engine comprising a first pair of spaced apart vertical wall portions disposed on the undersurface of said hull and extending longitudinally with respect to said hull, a second pair of spaced apart vertical wall portions extending transversely with respect to said hull, with a first of said second pair of wall portions disposed at an intermediate location between the bow and the stern of said hull and with a second of said second pair of wall portions disposed proximate to said stern of said hull, a horizontally disposed wall portion extending between said first and said second pair of wall portions and with said first pair of wall portions, said second pair of wall portions and said horizontal wall portion, in combination defining a longitudinal cavity which projects inwardly into said hull, a plurality of exhaust ports disposed on said first wall of said second pair of

wall portions, with said exhaust ports directed longitudinally with respect to said hull and directed toward said stern and connection means connecting said exhaust ports with said propulsion engine for the purpose of introducing exhaust gases into said cavity in order to reduce hull-to-water friction, a pair



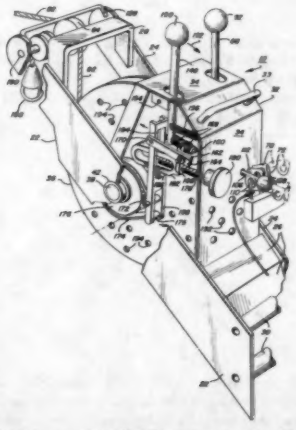
of longitudinal keel members disposed, one each, on port and on starboard sides of said cavity, with lower surfaces of said keel members including a longitudinally grooved portion, and connection means disposed to introduce exhaust gases from said propulsion engine into forward portions of said keel members.

4,393,803

BOAT ROPE CONTROLLER

Richard W. Donalies, 1545 Newcastle La., Hoffman Estates, Ill. 60194

Filed Aug. 5, 1980, Ser. No. 175,514
Int. Cl.³ B63B *21/16*
U.S. Cl. 114—254 **9 Claims**



2. A boat rope controller for a boat rope which is used for water skiing or other related water sports, anchoring and general marine towing, said boat rope controller comprising:

mounting means attached to the rear of a boat for providing occupants of the boat with an uninterrupted view;

a framework including two substantially parallel support arms, one end of said framework engaging said mounting means at an angle to extend said framework generally upward from said mounting means and rearward of the boat;

a reel means mounted for free rotation to said framework between and near the central portion of said two support arms for containing said boat rope;

a pulley mounted for free rotation to said framework between and at the end of said two support arms opposite said mounting means, said pulley and said reel means being substantially aligned whereby said boat rope can readily pass to or from said reel means via said pulley;

mode control means operable with said reel means for selectively securing said reel means to prevent its rotation and for releasing said reel means to allow its rotation;

driving means attached to said reel means for rotating said reel means, said driving means being removable from said rope controller and said driving means and said mode control means being operable from a safe position with the boat;

rope guide means cooperatively associated with said reel means and said pulley for restricting the movement of said boat rope relative to said reel means and said pulley and, thereby, preventing malfunctions due to tangling and knotting of the boat rope within the rope controller;

a service cover mounted to said framework, said service cover, together with said framework, forming a substantially contiguous outer surface around said contained boat rope and any internal parts whereby said service cover and said framework protect the occupants of the boat form the potential danger of internal moving parts, shield the occupants from spewing water from rotating internal parts and the boat rope, deter unauthorized tampering and dismantling of the rope controller, and protect internal parts and the boat rope from environmental elements; and

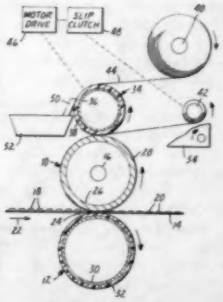
cover locking means operable with said service cover for locking said service cover to said framework, said cover locking means including drive locking means for securing said driving means while allowing for removal of said driving means and said service cover being not removable when said driving means is secured, whereby inadvertent or unauthorized access to or dismantling of said rope controller is prevented.

4,393,804

APPARATUS FOR REMOVING TONER FROM AND APPLYING OFFSET PREVENTIVE LIQUID TO A FIXING ROLLER

James C. Nygard, Maplewood; Melvin P. Weiss, Woodbury, and Thomas E. Larsen, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 12, 1981, Ser. No. 320,545
Int. Cl.³ B05C *11/00*
U.S. Cl. 118—60 **10 Claims**



1. Apparatus for removing toner material offset to a rotatable fixing roller and applying offset preventing liquid to the fixing roller including:

a supply core;

a rotatable take-up core;

a rotatable pressure roller having an outer layer of resilient material;

a web member adapted to be moved from said supply core to said take-up core via said pressure roller, said pressure roller positioned to provide a contact nip for said web member with the fixing roller opposite said pressure roller wherein contact of said web member with the fixing roller at said contact nip removes toner material offset to the fixing roller; and

an offset preventing liquid applicator means positioned between said supply core and said contact nip for applying offset preventing liquid to the surface of said web member that is brought into contact with the fixing roller.

4,393,805

PIPELINE PIG FOR LINING PIPE LINES

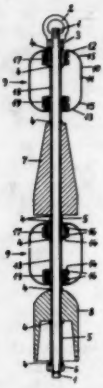
Hubert Boer, Reken, Fed. Rep. of Germany, assignor to diga-die gasheizung GmbH, Essen, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 325,621

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046608

Int. Cl.³ B05C *7/00*

U.S. Cl. 118—105 **7 Claims**



1. In a pipeline pig for lining a pipe line with an internal coating of a solidifying plastic composition with which the pipe line is spread by means of the pig which is adapted during operative movement of the pig to be drawn in the pipe line in only one direction of movement of the pig with respect to the pig, the pipeline pig having at least one spreader body and at least one forward and one rear guide body, the improvement wherein

each said guide body comprises means for exact central and coaxial guiding of the spreader body in the pipe line comprising,

at least three narrow, resiliently elastic guide pieces bent into U-form, each of said guide pieces comprising a middle part with forward and rear U-legs at ends thereof and rounded transitions from the middle part to the U-legs,

said middle parts extending in an axial direction of the pipeline pig for the exact central and coaxial guidance of the pipeline pig in the pipe line by abutment on an inner wall of the pipe line and being offset in relation to one another in a circumferential direction,

means for securing said forward U-legs non-displaceably in the axial direction in the pig,

a common bearing means for displaceably mounting said rear U-legs in the axial direction in the pig, said rear U-legs of said guide pieces being secured to said common bearing, said forward U-legs being located forwardly with respect to said only one direction of movement of the pig and said rear U-legs being located rearwardly, opposite with respect to said only one direction of movement of the pig.

4,393,806

BOAT FOR THE EPITAXIAL GROWTH FROM THE LIQUID PHASE

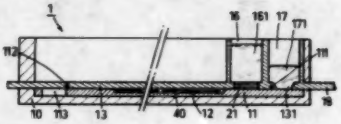
Marc Mahieu; Philippe Vandenberg, both of Caen, and Jacques J. Varon, Troarn, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1981, Ser. No. 237,816

Claims priority, application France, Feb. 27, 1980, 80 04323

Int. Cl.³ H01L *21/208*

U.S. Cl. 118—412 **5 Claims**



1. A boat for use in a device for liquid phase epitaxial growth of two successive semiconductor layers on a plurality of semiconductor substrates, said boat comprising

a crucible structure,

a bottom support layer of said crucible structure having a cavity for holding said substrates,

a slide layer positioned above said support layer and extending for linear movement through opposite end walls of said crucible structure,

two reservoirs for liquid solutions provided on said slide layer, one of said two reservoirs having said support layer as a bottom, and

a removable sealing element provided in said slide layer to act as a bottom for the other of said two reservoirs.

4,393,807

SPINNER

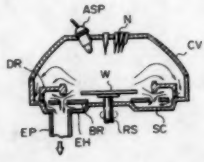
Shuzo Fujimura, and Atsuyuki Yasuda, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 15, 1980, Ser. No. 187,515

Claims priority, application Japan, Sep. 19, 1979, 54/119242

Int. Cl.³ B05C *5/00*

U.S. Cl. 118—501 **6 Claims**



1. A spinner comprising: a rotating spindle for causing a workpiece to spin at a high speed, and a cup disposed around said spindle and provided at a buttom wall thereof with a port for air evacuation, said cup comprising a deflector ring disposed in the interior of the cup and extending inwardly, said deflector ring having an annular barrier at the inner peripheral edge for defining steps projecting from the upper and lower surfaces of the ring, respectively, said barrier having an inner peripheral surface formed to diverge at least upwardly with respect to the axis of the spindle, and wherein said deflector ring has an outer peripheral wall for defining with the side wall of the cup an annular space therebetween, said outer peripheral wall of the deflector ring being provided with a plurality of holes for air evacuation arranged approximately equidistantly

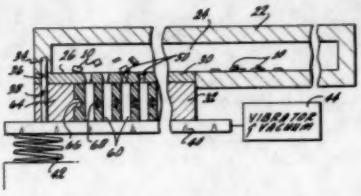
in the circumferential direction, whereby the interior of the cup is also in communication with the air evacuation port in the bottom wall of the cup, via a second route including said annular space and the air evacuation holes in the outer peripheral wall of the cup.

4,393,808

MEANS FOR PROCESSING MINIATURE ELECTRONIC COMPONENTS

Denver Braden, Carlsbad, Calif., assignor to Palomar Systems & Machines, Inc., Escondido, Calif.

Filed Oct. 9, 1980, Ser. No. 195,347
Int. Cl.³ B05C *11/14, 13/00, 13/02*
U.S. Cl. 118—503 **9 Claims**



1. Loading means orienting parts each having a configuration of right rectangular shape with a greater length dimension from end surface to end surface than width dimension from side surface to side surface and with a greater width dimension from side surface to side surface than thickness dimension from face surface to face surface, comprising:

(a) a loading plate having a multiplicity of through openings, said openings being disposed in juxtaposed rows, each opening extending therethrough from top face to bottom face of said plate and said openings receiving said parts from the top of said plate and said openings orienting said parts and discharging oriented parts from the bottom of said plate,

(b) each opening tapering from said top face to said bottom face to said plate to help feed said parts into said openings from the top of said plate, and

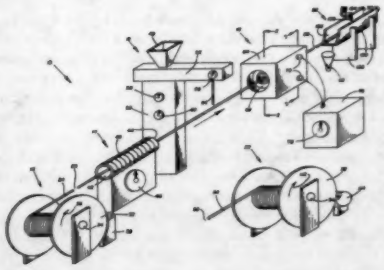
(c) each opening being formed at said bottom face of said plate with an oblong shape having a width generally matching said thickness dimension of said parts and less than said length and width dimensions of said parts in order to orient said parts relative to the axis of each part from face surface to face surface thereof.

4,393,809

APPARATUS FOR MANUFACTURING MAGNET WIRE

George D. Hilker, Fort Wayne, Ind., assignor to Phelps Dodge Industries, Inc., New York, N.Y.

Filed Aug. 7, 1978, Ser. No. 931,314
Int. Cl.³ B05B *5/02;* **B05C** *5/00, 9/08*
U.S. Cl. 118—620 **15 Claims**



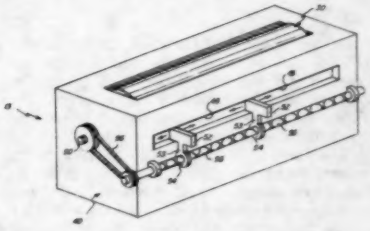
1. An apparatus for the manufacture of coated filaments such as magnet wire comprising a die, a bare filament pay-out device, a coated filament take-up device, said die being located between said pay-out and take-up devices, said die having a throat portion, an entrance opening larger than said throat portion interconnected by a converging interior wall, thereby defining a cavity between said throat portion and said opening, said die being positioned to receive a filament trained between said pay-out and take-up devices in said opening and throat portion, said die being fixed in position, a reservoir of flowable but hardenable material, a flowable material applicator connected to said reservoir means, said applicator applying said material to said filament just prior to said filament entering said die and in excess of that required to coat said filament to a desired thickness in a single pass, whereby said excess collects in said die cavity, and means including said material in said die cavity for centering said filament in said throat portion.

4,393,810

ELECTROGRAPHIC DEVELOPMENT APPARATUS AND METHOD HAVING OSCILLATING MAGNETIC CROSS-MIXING

George P. Kasper, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 20, 1982, Ser. No. 380,173
Int. Cl.³ G03G *15/09*
U.S. Cl. 118—657 **10 Claims**



1. In electrographic development apparatus of the kind adapted for use at a development zone which extends transversely across the operative path of an electrographic imaging device, said development apparatus including means providing a developer supply zone and magnetic brush means for transporting developer along a developer path from said supply zone into a developing position at the development zone and then back toward the developing position or the supply, the improvement comprising:

(a) cross-mix magnet means mounted proximate a transverse portion of said developer path; and

(b) means for oscillating said cross-mix magnet means along said developer path portion whereby developer moving past said portion of said developer path is intermixed transversely across said developer path.

2. In electrographic development apparatus of the kind adapted for use at a development zone which extends transversely across the operative path of an electrographic imaging device, said development apparatus including a developer housing providing a supply zone for electrographic developer and magnetic feed means for transporting developer along a developer path from said supply zone to a developing position at the development zone and then back toward the supply zone, the improvement comprising:

(a) a non-magnetic housing portion extending transversely of, and in closely spaced relation to, said developer path at a location displaced from said developing position;

(b) cross-mix magnet means mounted in close relation to said non-magnetic housing portion and on the housing side external with respect to the developer path; and

(c) means for oscillating said cross-mix magnet means along

said non-magnetic housing portion whereby developer moving along the developer path will be shifted transversely with respect to the operative path of the electrographic imaging device.

4,393,811

WEIGHTED TEAT CUP SHELL AND ASSEMBLY

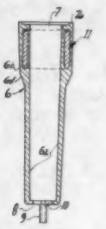
Syd E. Bodmin, Otumoetai, New Zealand, assignor to Mae Lois Moore, Tauranga, New Zealand

Filed May 1, 1981, Ser. No. 259,715

Claims priority, application New Zealand, Mar. 24, 1981, 196595

Int. Cl.³ A01J 5/04

U.S. Cl. 119—14.47 **9 Claims**



1. A teat cup shell comprising a body having an upper portion with an open end arranged to receive a complimentary upper portion of a teat cup inflation and a lower portion including an aperture through which a lower portion of the teat cup inflation may pass wherein the body of the teat cup shell is formed in a mouldable material and includes at least one internally moulded and inset weight, said internally moulded and inset weight being positioned in the upper regions of the teat cup shell and extending in length substantially throughout the upper portion of the teat cup shell where the walls thereof are thicker such that the centre of mass of the teat cup shell due to the presence of the inset weight in the upper region is within the upper region;

wherein the upper region of said teat cup body is provided with a substantially circular outer surface and the lower region of the body is provided with a substantially oval outer surface and the internal bore of the teat cup shell is such that the width in a first plane is greater than the width in a second plane at right angles to the first plane.

4,393,812

SWINE FARROWING HUT AND METHOD OF FARROWING PIGS AND MAINTAINING A DISEASE-FREE FARROWING HUT

Claude W. Ahrens, Grinnell, Iowa, assignor to Miracle Recreation Equipment Company, Grinnell, Iowa

Continuation of Ser. No. 945,084, Sep. 25, 1978, Pat. No. 4,269,144. This application May 26, 1981, Ser. No. 267,089

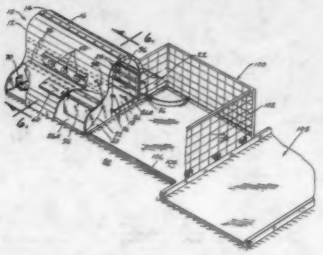
Int. Cl.³ A01K 1/02

U.S. Cl. 119—16 **1 Claim**

1. Method of farrowing pigs and providing and maintaining a disease free single litter farrowing hut wherein the hut includes a floor and an enclosure with the enclosure being pivotable from a position over the floor to an open raised position whereby the floor and the entire interior of the enclosure may be exposed to the sun, including the steps of, providing a substantially non-porous hut, which bacteria cannot penetrate,

locating the farrowing hut outside in the open in substantial spaced relation to other farrowing huts so that each litter has fresh air and is not breathing the air from another adjacent litter and in a position relative to the sun that sun rays will reach the substantial area of the floor and interior of the enclosure when in the raised open position,

following the removal of one sow and litter and before the admission of the next sow pivoting the enclosure to the raised open position and washing the floor and the interior of the enclosure thoroughly,



maintaining the enclosure in the open position such that the floor and enclosure interior are exposed to the sun's rays long enough to kill all bacteria in the hut, and

lowering the enclosure to the closed position and moving another sow into the hut for farrowing.

4,393,813

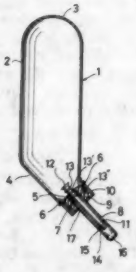
WATERING DEVICE FOR PET ANIMALS

Teho Sou, 7-18 Higashiimazato 2-chome, Higashinari-ku, Osaka, Japan

Filed Jun. 29, 1981, Ser. No. 278,854

Int. Cl.³ A01K 7/00

U.S. Cl. 119—72.5 **3 Claims**



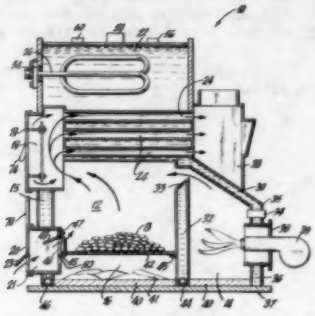
1. A watering device for pet animals, which comprises; an elongated sucking pipe extending downwardly from a hermetically sealed water container, and being so configured that pet animals can water from a suction port at the lower end of said sucking pipe; said sucking pipe comprising an elongated hollow cylinder of predetermined internal diameter open at both ends and made of a hard material which is not damaged by biting and chewing and an elongated cylindrical leakage-preventing plug disposed entirely within said hollow cylinder and container and having a longitudinal base of lesser diameter than said predetermined internal diameter, said plug being made of a material susceptible to damage by biting and chewing and being located protectively within said sucking pipe such that it cannot be contacted directly by said animals, said plug having engagement means on its outer surface for retaining it within said cylinder.

4,393,814

MULTI-FUELED BOILER

Raymond Sievert, 790 Old Colony Rd., Meriden, Conn. 06450

Filed Apr. 8, 1981, Ser. No. 252,254
Int. Cl.³ F22B 31/04
U.S. Cl. 122—22 8 Claims



1. A multi-fuel boiler having improved combustion efficiency comprising two compartments, said compartments each including external walls and an internal wall partially separating the compartments from each other to permit passage of heated gas from one compartment to the other so that the fuels may be burned in each compartment in sequence or simultaneously,

wherein said compartments comprise a front compartment for combustion of a solid fuel positioned and connected to and communicating with said front compartment, a rear compartment for combustion of a fluid fuel, and an ash pit positioned in front of said rear compartment and beneath said front compartment and separated from said front compartment by a grate to hold solid fuel;

means in one compartment to burn fluid fuel and means in the other compartment to burn solid fuel, a water-filled supply tank positioned above said front compartment;

wherein said internal wall between the two compartments is a substantially vertical water-conductive wall connected to said water supply tank to heat the water of said tank;

a plurality of fire tubes each having inlet and exhaust orifices, said fire tubes passing through said water supply tank, said fire tubes having their inlet orifices connected to said front compartment to receive hot combustion gases from both said compartments, said fire tubes heating the water within the supply tank and being connected to a flue for exhausting combusted gases.

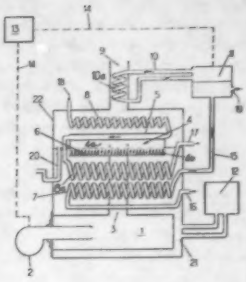
4,393,815

HEATING PLANT

Niels R. Pedersen, Nybrogaasrdsvej 59, and Eyvind S. Nielsen, Alsoddevej 35, both of Hadsund, Denmark (DK 9560)

PCT No. PCT/DK80/00048, § 371 Date Apr. 16, 1981, § 102(e) Date Apr. 16, 1981, PCT Pub. No. WO81/00611, PCT Pub. Date Mar. 5, 1981
PCT Filed Aug. 15, 1980, Ser. No. 253,928
Int. Cl.³ F22B 1/02
U.S. Cl. 122—31 R 13 Claims

1. A heating plant comprising a housing, a combustion chamber, a high pressure burner associated with the combustion chamber, an exhaust pipe extending from the combustion chamber vertically within the housing and terminating within a smoke trap provided in the housing, the smoke trap including a dome having a downwardly extending skirt, the skirt extending below the top level of the exhaust pipe, means for maintaining a smoke washing liquid level below the level of the exhaust pipe and above the bottom edge of the dome skirt within the housing, openings provided in the dome skirt in the area below the liquid level, said openings decreasing in area from the bottom edge of the skirt to the top limit of said openings below the level of the liquid, an exhaust stack communicating with the housing above the dome, and heat exchange means associated with the housing through which heat exchange fluid may be circulated for extracting the heat generated in the heating plant.

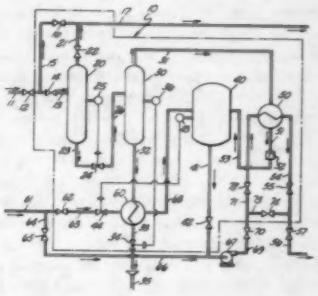


4,393,816

THERMODYNAMIC METHOD FOR STEAM-WATER SEPARATION

Paul A. Bock, 2246 N. Edinboro Ave., Claremont, Calif. 91711

Filed Feb. 10, 1982, Ser. No. 347,470
Int. Cl.³ F22D 1/00
U.S. Cl. 122—412 7 Claims



1. In the method of improving the quality of wet process steam produced by conventional and once through type boilers by removing moisture therefrom while reducing the quantity of boiler feedwater required to produce the resulting high quality dried steam, the steps comprising:

(a) introducing wet process steam from a boiler to a steamwater separation vessel to separate entrained moisture and dry the steam to form relatively dry process steam;

(b) removing from the separation vessel the separated moisture therein as a water stream including dissolved solids and passing said stream through a pressure reducing control valve to vaporize said water to form low pressure steam;

(c) introducing said low pressure steam to a low pressure flash vessel and flashing said steam therein to separate moisture therefrom and form low pressure dry steam;

(d) removing from the flash vessel the separated moisture therein as a low pressure water stream including higher quantities of dissolved solids and passing said stream through a feedwater preheater in indirect heat exchange relationship with fresh boiler feedwater to preheat said feedwater and cool said water stream;

(e) removing from the flash vessel the low pressure dry steam

produced therein and passing said steam through a condensing heat exchanger to condense said steam for form a recovered hot stream of boiler feedwater substantially free of dissolved solids;

(f) mixing the preheated stream of fresh boiler feedwater with the relatively hot stream of recovered boiler feedwater in a holding tank to form a combined feedwater stream having a temperature greater than that of the preheated fresh boiler feedwater and pumping said hot combined feedwater stream under high pressure through the condensing heat exchanger in indirect heat exchange relationship with the low pressure dry steam from the flash vessel to further heat said combined feedwater stream and to condense said steam and thence to said boiler for use therein in the production of steam;

(g) discharging the water stream leaving the feedwater preheater, together with the included high quantities of dissolved solids, as a relatively cool waste stream; and

(h) removing from the separation vessel, as an improved quality product, the relatively dry process steam.

5. In the method of improving the quality of high temperature, high pressure wet process steam produced by conventional and once through type boilers by removing moisture therefrom while reducing the quantity of boiler feedwater required to produce the resulting high quality dried steam, the steps comprising:

(a) introducing wet high temperature, high pressure process steam from a boiler to a high pressure steam-water separation vessel to separate entrained moisture and dry the steam to form high temperature, high pressure relatively dry process steam;

(b) removing from the separation vessel the separated moisture therein as a high pressure, high temperature water stream including dissolved solids and passing said stream through a pressure reducing control valve to vaporize said water to form low pressure, high temperature steam;

(c) introducing said low pressure, high temperature steam to a low pressure flash vessel and flashing said steam therein to separate moisture therefrom and form low pressure dry steam;

(d) removing from the flash vessel the separated moisture therein as a low pressure, high temperature water stream including higher quantities of dissolved solids and passing said stream through a feedwater preheater in indirect heat exchange relationship with fresh boiler feedwater to preheat said feedwater and cool said water stream;

(e) removing from the flash vessel the low pressure dry steam produced therein and passing said steam through a condensing heat exchanger to condense said steam to form a recovered hot stream of boiler feedwater substantially free of dissolved solids;

(f) mixing the preheated stream of fresh boiler feedwater with the relatively hot stream of recovered boiler feedwater in a holding tank to form a combined feedwater stream having a temperature greater than that of the preheated fresh boiler feedwater and pumping said hot combined feedwater stream under high pressure through the condensing heat exchanger in indirect heat exchange relationship with the low pressure dry steam from the flash vessel to further heat said combined feedwater stream and to condense said steam and thence to said boiler for use therein in the production of steam;

(g) discharging the water stream leaving the feedwater preheater, together with the included high quantities of dissolved solids, as a relatively cool waste stream; and

(h) removing from the separation vessel, as an improved quality product, the high temperature, high pressure relatively dry process steam.

4,393,817

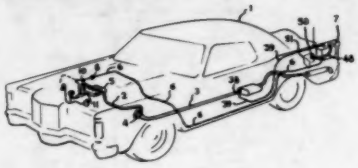
COMBUSTION AND POLLUTION CONTROL SYSTEM

John E. Lindberg, Lafayette, Calif., assignor to Owen, Wickersham & Erickson, San Francisco, Calif.

Division of Ser. No. 657,747, Feb. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 613,867, Sep. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 356,589, May 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 227,440, Feb. 18, 1972, abandoned. This application Sep. 25, 1980, Ser. No. 190,932

Int. Cl.³ F02B *43/08, 19/00, 47/00*

U.S. Cl. 123—3 **11 Claims**



1. A method for providing improved combustion and reduced emissions in an internal combustion engine, having a combustion zone and an exhaust, comprising

feeding both fuel and controlled amounts of an aqueous fluid comprising a mixture of steam and hydrogen into said combustion zone, and

in response to engine needs, increasing the weight ratio of said aqueous fluid to said fuel during engine acceleration.

4,393,818

COAL DUST COMBUSTION MOTOR

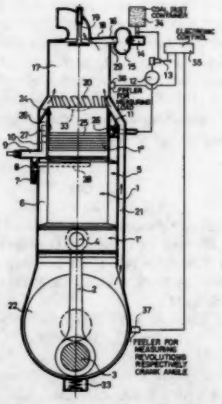
Otto Lefnaer, Brucknerstr. 68, 7000 Stuttgart 1, Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,347

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 3101910

Int. Cl.³ F02B *45/02*

U.S. Cl. 123—23 **28 Claims**



1. A coal dust combustion motor comprising a cylinder; a piston reciprocatable in said cylinder between a suction stroke and a compression stroke and defining between one end of said piston and a facing end wall of said cylinder a main combination space; a whirling chamber continuously communicating with said space in the region of said end wall of said cylinder; means for blowing a mixture of air and coal dust at a low pressure of about 5–7 atm into said whirling chamber during

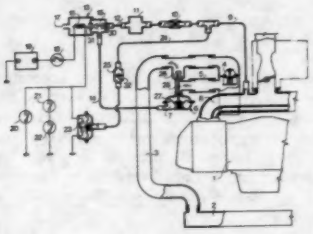
the compression stroke of said piston at a time at which the pressure in said space is greater than the effective pressure in said whirling chamber.

4,393,819

SYSTEM FOR CONTROLLING COOLING WATER TEMPERATURE FOR WATER-COOLED ENGINE

Takayuki Tanaka, Komae, and Rempei Matsumoto, Ohta, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1982, Ser. No. 371,761
Claims priority, application Japan, Apr. 30, 1981, 55-65672
Int. Cl.³ F01P 7/14
U.S. Cl. 123—41.08 **4 Claims**



1. A system for controlling cooling water temperature for a water-cooled engine having an intake passage, a radiator, a cooling water passage communicating a water jacket in said engine with said radiator, and a thermostat provided in said cooling water passage, said thermostat being so arranged as to open said passage when the cooling water temperature exceeds a predetermined value, said system comprising

a bypass for bypassing said thermostat;

bypass valve means provided in said bypass for closing the bypass;

solenoid valve means for actuating said bypass valve; and

switch circuit means connected parallel to said solenoid valve means for selectively switching the solenoid valve means;

said switch circuit means comprising a low temperature switch responsive to low cooling water temperature to effect the operation of said solenoid valve for closing said bypass valve of said bypass, a high temperature switch means responsive to high cooling water temperature to effect the operation of said solenoid valve for closing said bypass valve, and a light load switch means responsive to the light load operation of the engine to effect the operation of said solenoid valve for closing the bypass valve.

4,393,820

ROLLING CONTACT ROCKER ARM AND PIVOT

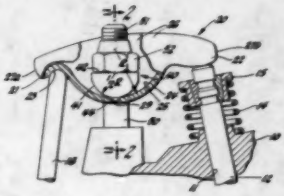
Emil R. Maki, Rochester, Mich.; Ferdinand Freudenstein, Riverdale, N.Y.; Raymond L. Richard, Jr., Port Clinton, Ohio, and Meng-Sang Chew, Sterling Heights, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 261,736, May 7, 1981, abandoned. This application Mar. 10, 1982, Ser. No. 356,926
Int. Cl.³ F01L 1/18
U.S. Cl. 123—90.41 **9 Claims**

1. A reciprocating internal combustion engine of the type having an engine block defining a cylinder with a port, a valve reciprocably located in said port and biased to a predetermined position, a valve actuator spaced from the valve and movable in opposite sense to reciprocate the same, and a valve train means including a rocker arm in engagement with the valve and the valve actuator and actuated in rocking movement to reciprocate said valve against said bias to open and close the port for engine operation, the improvement comprising:

means defining a rocking support intermediate the length of the rocker arm, said means and said rocker arm defining a pair of cooperating inner and outer cylindrical bearing surface contours carrying the reaction forces of rocker arm pivotal movement, the radius of the outer conformation being in the range of about 3 to 1.7 times the radius of the inner conformation;

restrainer means to anchor the cooperating cylindrical conformations for substantially rolling action in relation to each other, said restrainer means comprising a pin extending radially outward from the inner conformation and a recess in the outer conformation of a size to receive said pin,



said recess defining opposed sloping guide surfaces flaring outward in the direction toward the center of the outer conformation and over which the pin walks during rocker arm oscillation, the conformation of the pin being such that the pin moves in substantially walking motion during such reciprocation,

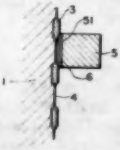
whereby within the range of rocker arm oscillation the pin establishes substantially rolling contact between the cylindrical surfaces by contact with the guide surfaces of the recess and itself executes substantially rolling contact with the guide surfaces defined by the recess.

4,393,821

CYLINDER OR CYLINDER LINER

Shigeru Urano, Omiya, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed May 19, 1980, Ser. No. 151,064
Claims priority, application Japan, May 22, 1979, 54-62198
Int. Cl.³ F02F 1/00
U.S. Cl. 123—195 C **6 Claims**

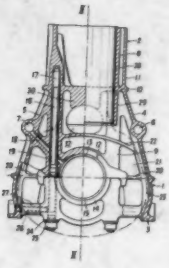


1. An internal combustion engine comprising: a piston, a cylinder and a cylinder liner, said piston being operatively disposed in said cylinder, said cylinder liner having a plurality of spaced separate annular hardened layers produced directly from the cylinder liner without discontinuity, on the inner peripheral surface of said liner in the vicinity of the top dead center of said piston, the distance between adjacent annular hardened layers being smaller than an axial length of a piston ring of said piston.

4,393,822
WATER-COOLED, MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Bertram Obermayer; Othmar Skatsche, and Josef Greier, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Aug. 15, 1980, Ser. No. 178,586
Claims priority, application Austria, Aug. 28, 1979, 5759/79
Int. Cl.³ F02F 7/00
U.S. Cl. 123—195 R **4 Claims**



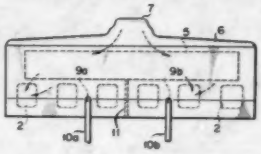
1. A water-cooled internal combustion engine comprising:
a cylinder block;
a cooling jacket provided in said cylinder block;
a plurality of in-line cylinders provided in said cylinder block each having a cylinder diameter, a lower end portion and a bottom edge portion;
a plurality of crankshaft main bearings each formed from first and second bearing portions;
a plurality of main bearing bolts each having threads formed thereon for mutually connecting said first and second bearing portions;
means for connecting each of said cylinders to said cooling jacket at said lower end portion of each of said cylinders at a distance from said bottom edge portions of each of said cylinders corresponding to 0.5 to 0.75 times said cylinder diameter; and
means for exclusively interconnecting said lower end portion of each of said cylinders wherein said means for exclusively interconnecting said lower end portion of each of said cylinders is disposed between adjacent cylinders below said means for connecting said cylinders to said cooling jacket such that said lower end portion of each of said cylinders is substantially unconstrained from said bottom edge portion of each of said cylinders up to a distance corresponding to 0.2 to 0.4 times said cylinder diameter, and wherein said threads formed on said main bearing bolts are disposed within said cylinder block at a distance from said bottom edge portion of each of said cylinders at least as great as the distance from said means for exclusively interconnecting said lower end portion of each of said cylinders to said bottom edge portion of each of said cylinders.

4,393,823
SUCTION VALVE SEAT LUBRICATING APPARATUS

Hideo Furukawa; Kazuo Chikugo, and Yoichi Otsuki, all of Oyama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 18, 1981, Ser. No. 275,103
Claims priority, application Japan, Jun. 25, 1980, 55-88156[U]
Int. Cl.³ F01M 1/00
U.S. Cl. 123—196 M **2 Claims**

1 In a diesel engine including a plurality of cylinders, a turbocharger, a compressor driven by the turbocharger for compressing a suction air, a suction manifold connected to the compressor, a plurality of cylinder heads each having a suction port and a valve insert with a valve seat formed therein, each suction port being connected to the suction manifold and a plurality of suction valves each adapted to intermittently seat on the respective valve seats wherein said cylinders are divided into first and second groups each group having a plurality of cylinders with different phase of suction strokes from one to another and having no overlap therebetween; a suction valve seat lubricating apparatus comprising a partition wall disposed in said suction manifold dividing the same into first

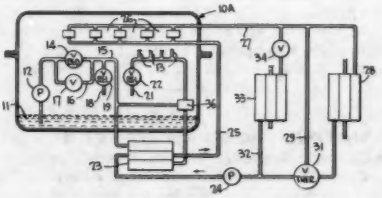


and second chambers, said first chamber being communicated with said first group of cylinders and said second chamber being communicated with said second group of cylinders, and a pair of lubricant supply means each connected to and open within said first or second chamber for supplying lubricant thereinto whereby supplied lubricant may be carried by the suction air to the respective valve seats sequentially so as to lubricate the same.

4,393,824
HEATING SYSTEM

Friedrich B. Fischer, Cologne, and Gottfried Moser, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Oct. 19, 1981, Ser. No. 312,758
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1980, 3039372
Int. Cl.³ F01M 1/00
U.S. Cl. 123—196 AB **12 Claims**



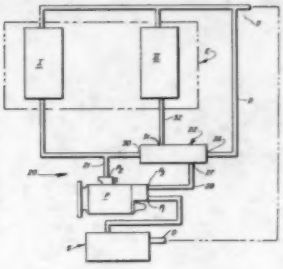
1. In an internal combustion engine having an oil distribution system normally operable at a predetermined pressure level, said system including a main oil conduit, a pump for suctioning oil from an oil sump of the engine and feeding the oil to oil distributing points or galleries of said oil distribution system, an oil heating system comprising solely said oil distribution system wherein said pump comprises a high-pressure pump producing a pressure of about one order of magnitude higher than said predetermined level, a pressure-reducing element in said conduit between said pump and said oil distributing points for reducing the oil pressure flowing therethrough and thereby increasing the oil temperature before the oil reaches said oil distributing points or galleries of said oil distribution system.

4,393,825

SYSTEM FOR CONTROLLING FUEL FLOW WITHIN AN INTERNAL COMBUSTION ENGINE

Philip L. Breeck; David E. Shultz, and Andrew C. Rosselli, all of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 31, 1980, Ser. No. 221,768
Int. Cl.³ F02M 63/02
U.S. Cl. 123—198 F 11 Claims



1. A system for controlling fuel flow within an internal combustion engine having a plurality of cylinders, said system comprising a fuel source; a fuel pump responsive to the speed of the engine and having an inlet connected to said fuel source, a first outlet connected to a first fuel supply line for a predetermined number of first cylinders, and a second outlet; and a multi-mode adjustable control valve having a housing provided with a first port connected to a drain communicating with the fuel source, a second port connected to the second outlet of said fuel pump, a third port connected to the first fuel supply line, and a fourth port connected to a second fuel supply line for a predetermined number of second cylinders; said control valve, when the engine is operating below a predetermined first speed and/or below a predetermined operating temperature, automatically assuming a first mode wherein fuel flow to the second cylinders is substantially cut off except for a predetermined restrictive amount of fuel flow thereto under a predetermined low pressure to effect continuous lubrication of said second cylinders, and when the engine is operating above said predetermined operating temperature, the control valve automatically assumes a second mode wherein there is substantially unrestricted fuel flow to the second cylinders.

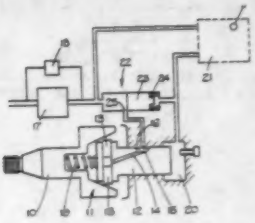
4,393,826

LIQUID FUEL INJECTION PUMPING APPARATUS

Brian W. Tumber, Greenford, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 13, 1981, Ser. No. 310,992
Claims priority, application United Kingdom, Dec. 23, 1980, 8041282
Int. Cl.³ F02D 17/00, 1/06
U.S. Cl. 123—198 DB 4 Claims

1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine comprising an injection pump operable in use to deliver fuel in timed relationship with an associated engine, a low pressure supply pump for supplying fuel to the injection pump, valve means for controlling the output pressure of the supply pump, a resiliently loaded component defining a surface against which a control pressure can act to enable the amount of fuel supplied at each injection stroke of the injection pump to be varied, a control valve for deriving said control pressure from the output pressure of the supply pump, and a valve responsive to the pressure drop across said control valve, said valve being included in the flow path between the low pressure supply pump and the injection pump, said valve being arranged to prevent flow of fuel along



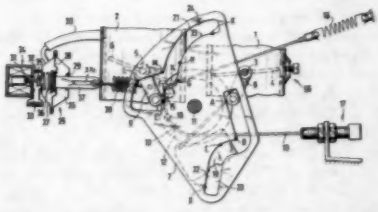
said flow path in the event that the pressure drop across said control valve falls below a predetermined value.

4,393,827

MULTICYLINDER INTERNAL COMBUSTION ENGINE, ESPECIALLY FOR AUTOMOTIVE VEHICLES AND PROCESS FOR SUPPLYING OF A FUEL-AIR MIXTURE THERETO

Wolfgang Schmid, Markgröeningen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,485
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1980, 3044248
Int. Cl.³ F02M 13/04; F02D 17/00
U.S. Cl. 123—198 F 30 Claims

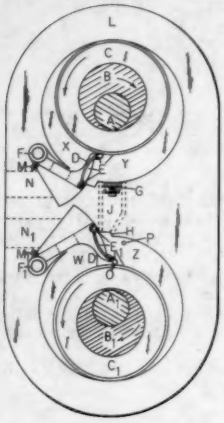


1. Multicylinder internal combustion engine having separate cylinder groups, each cylinder group being associated with a fuel-air mixture supply means for selectively supplying a fuel-air mixture or only air thereto, wherein each cylinder group is associated with a throttle valve arranged in an intake pipe, each throttle valve being connected to a control lever and the position of the throttle valves being variable by an accelerator pedal actuated cam disk which is arranged to coact with the control levers, the control lever connected to the throttle valve that is associated with the first cylinder group coacts with a single curved path of the cam disk in all operating ranges of the internal combustion engine, both when the engine is warmed-up for operation and in the warming-up phase of the internal combustion engine; the control lever connected to the throttle valve that is associated with the second cylinder group coacts with a first curved path, that is correlated with a predetermined partial load range, when the internal combustion engine is warmed-up for operation, and coacts with a second curved path, that is correlated with all operating ranges of the internal combustion engine, in the warming-up phase of the internal combustion engine and when the engine is warmed-up, about the predetermined partial load range up to full load, characterized in that

said single curved path cooperating with the control lever of the first cylinder group is an inner path of a first guide slot, said first curved path coacting with the control lever of

the second cylinder group is an outer path of a second guide slot, and said second curved path coacting with the control lever of the second cylinder group is an inner path of said second guide slot.

4,393,828
ROTARY ENGINE
Frank H. Jolly, 1832 Glendale Dr., Arcata, Calif. 95521
Filed Apr. 29, 1981, Ser. No. 258,597
Int. Cl.³ F02B 53/08
U.S. Cl. 123—203 **1 Claim**



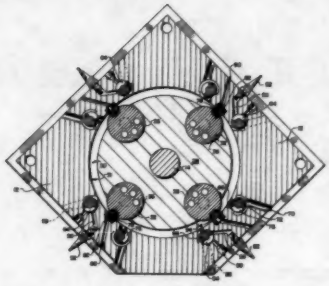
1. An internally-cooled rotary engine comprising:

two connected housings with hollow chambers therein; said chambers interconnected by a high temperature fire tube, said fire tube composed of high temperature material, said fire tube insulated from said housing by high temperatures insulation material and air space, said fire tube maintained at high temperature;

one of said chambers comprising a compression chamber, said chamber affixed with inlet means for gaseous mixture, said chamber equipped with a roller rotatably mounted on an eccentric crank to rotate inside said chamber, said roller equipped with resilient circular face seals, said chamber housing a rocking vane dividing said chamber into separate intake and compression volumes, said rocking vane mounted in said chamber with a shaft, said rocking vane sealed to said roller with a projection shaped to seal by entrained gas pressure, said rocking vane sealed to said chamber by resilient seals on face, projection, and sides, said rocking vane being lightly pressed against said roller by spring means;

the second of said chambers comprising an expansion chamber affixed with outlet means for expanded gases and steam, said second chamber equipped with a roller rotatably mounted on an eccentric crank to rotate inside said chamber, said roller equipped with resilient circular face seals, said second chamber housing a rocking vane dividing said chamber into separate expansion and exhaust volumes, said rocking vane mounted in said chamber with a shaft, said rocking vane sealed to said roller with a projection shaped to seal by entrained gas pressure, said rocking vane sealed to said chamber by resilient seals on face, projection, and sides, said rocking vane being lightly pressed against said roller by spring means, said second chamber affixed with inlet control and timing means by a projection valve on said rocking vane; said second chamber affixed with water injection means by hollow passages and spray nozzles in said rocking vane, said second chamber having a displacement equal to or greater than the displacement of the compression chamber.

4,393,829
ROTARY ENGINE
William P. Gardiner, Dallas, Tex., assignor to W. G. Slow T. (a partnership), Dallas, Tex.
Filed Sep. 15, 1980, Ser. No. 187,319
Int. Cl.³ F02B 53/00
U.S. Cl. 123—249 **7 Claims**



1. A rotary engine comprising:

a casing having a cylindrical bore and a plurality of combustion chambers spaced circumferentially externally of the bore;

a fuel supply for supplying a combustible fuel mixture;

a drive shaft concentrically received within the bore and journaled for rotation;

a rotor concentrically mounted on said drive shaft and having a radius less than the radius of the bore, and having a plurality of vane chambers equally spaced circumferentially around said rotor;

a plurality of first valves spaced circumferentially around the bore, said first valves alternately establishing and suppressing fluid communication between the bore and the exterior of said casing;

a plurality of second valves spaced circumferentially around the bore, said second valves separately and sequentially establishing and suppressing fluid communication between the bore and the combustion chambers, the combustion chambers and said fuel supply, the exterior of the casing and the bore, and said fuel supply and the bore, respectively;

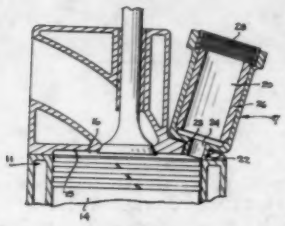
a plurality of quadrant dividers equally spaced circumferentially around the bore, said quadrant dividers projecting radially into the interior of the bore a distance substantially equal to the difference between the radius of the bore and the radius of said cylindrical rotor, thereby forming a plurality of arcuate chambers; and

a plurality of cylindrical vanes rotatably received within the vane chambers and disposed for rolling contact with the wall of the bore, and each of said vanes having a notch disposed so that said vanes will rollably contact said quadrant dividers while suppressing fluid communication between adjacent pairs of arcuate chambers.

4,393,830
ACOUSTIC DETONATION SUPPRESSION IN A CATALYTIC ENVIRONMENT IN INTERNAL COMBUSTION ENGINE
Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406
Filed Jul. 28, 1978, Ser. No. 929,165
Int. Cl.³ F02B 27/00, 51/02
U.S. Cl. 123—272 **14 Claims**

1. In an internal combustion engine, having a combustion chamber and an ante-chamber dimensioned to suppress detona-

tion waves generated in said chamber in fluid communication with said combustion chamber, the improvement comprising:



catalytic means contained in said ante-chamber for facilitating the combustion within said combustion chamber.

4,393,831

CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

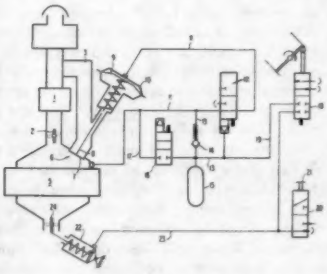
Horst Bergmann, Esslingen, and Hans Pracht, Weinstadt, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 9, 1981, Ser. No. 310,235

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 3038233

Int. Cl.³ F02D 9/06; F02M 23/08

U.S. Cl. 123—323 **14 Claims**



1. A control system for a mixture-compressing internal combustion engine comprising a carburetor means, an intake manifold means, a throttle valve means disposed in the intake manifold means, and an idle channel means for bypassing the throttle valve means, an additional channel means only forming an air channel bypasses the carburetor means and throttle valve means for introducing air into the intake manifold means, the additional channel means terminates in the intake manifold means at a position downstream of the idle channel means, first valve means are provided for controlling a communication between the additional channel means and the intake manifold means, the first valve means is located between the throttle valve means and inlet openings of the internal combustion engine, a diaphragm means is connected to the valve means for controlling an opening and closing of the valve means, line means are interposed between the diaphragm means and the intake manifold means for enabling an exposing of a side of the diaphragm means facing away from the first valve means to intake manifold vacuum, a further valve means, controlled by intake manifold vacuum, is disposed in the line means for enabling a venting of the diaphragm means and opening of the first valve means when the intake manifold vacuum is above an idle value, during a coasting operation of the engine whereby the side of the diaphragm means facing away from the first valve means can be evacuated to activate the first valve means so that air exclusively flows into the intake manifold through the air channel means, thereby permitting an introduction of air into the intake manifold means through the additional channel means, and means are provided for controlling a positioning of the further valve means.

4,393,832

BRAKING DIESEL ENGINES

Olof Samuel, Stockholm, Sweden, and Heikki Hellemaa, Abo, Finland, assignors to Nordstjernan AB, Stockholm, Sweden and Oy Warstsila AB, Abo, Finland

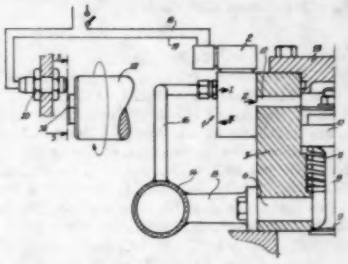
PCT No. PCT/SE80/00245, § 371 Date Jun. 5, 1981, § 102(e) Date Jun. 5, 1981, PCT Pub. No. WO81/01030, PCT Pub. Date Apr. 16, 1981

PCT Filed Oct. 7, 1980, Ser. No. 276,348

Claims priority, application Sweden, Oct. 10, 1979, 7908405

Int. Cl.³ F02D 35/00

U.S. Cl. 123—327 **10 Claims**



1. In an apparatus for controlling he braking action of a diesel engine having a plurality of combustion chambers in which pressurized air is supplied tto the combustion chambers from a source of pressurized air during the compression stroke of the engine through valve means provided in the combustion chambers, each valve means having at least one conduit providing fluid communication between the source of pressurized air for introducing pressurized air to and discharging air from the valve means when in an open position, which valve means is opened by pressurized air supplied through a second conduit to a piston forming part of said valve means and slideably positioned in a cylinder located external to the combustion chamber, the improvement comprising:

a means for controlling the introduction of pressurized air to and discharge of air from the piston and cylinder, including

an electro-magnetic valve placed intermediate the source of pressurized air and the cylinder, which electro-magnetic valve is adapted to be slideably moved between an open position in which air is introduced to the cylinder and a closed position in which air is discharged from the cylinder; and

a means for producing an electrical signal and actuating said electro-magnetic valve including an electrical transmitter electrically connected to said electro-magnetic valve, said transmitter being operatively associated with a means for transmitting rotational motion of the engine to the transmitter, such that the electro-magnetic valve is briefly opened at approximately the commencement and conclusion of the compression stroke.

6. In a method for controlling the braking action of a diesel engine having a plurality of combustion chambers in which pressurized air is supplied to the combustion chambers from a source of pressurized air during the compression stroke of the engine through valve means provided in the combustion chambers, each valve means having at least one conduit providing fluid communication between the source of pressurized air for

introducing pressurized air to and discharging air from the valve means when in an open position, which valve means is opened by pressurized air supplied through a second conduit to a piston forming part of said valve means and slideably positioned in a cylinder located external to the combustion chamber, the improvement comprising:

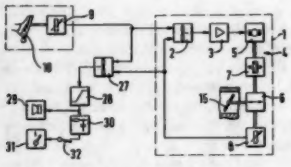
controlling the introduction of pressurized air to and discharge of air from the piston and cylinder, by driving an electrical transmitter with a means for transmitting rotational motion of the engine, said electrical transmitter producing an electrical signal in and actuating an electromagnetic valve arranged intermediate the source of pressurized air and the cylinder, the electrical signal so produced causing said electromagnetic valve to open and admit air to the cylinder, and closing said electromagnetic valve by terminating the electrical signal and discharging air from the cylinder, such pressurized air is introduced to the combustion chambers at approximately the commencement of the compression stroke and air is discharged from the compression stroke at approximately the end of the compression stroke.

4,393,833

DEVICE FOR THE CONTROL OF THE TRAVELING SPEED OF A MOTOR VEHICLE

Arnold Mann, Bieber, and Harald Collonia, Königstein, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 86,828, Oct. 22, 1979, Pat. No. 4,313,408, which is a division of Ser. No. 894,371, Apr. 7, 1978, abandoned.
This application Aug. 10, 1981, Ser. No. 291,531
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1977, 2753702; Dec. 2, 1977, 2753703; Dec. 9, 1977, 2754826
Int. Cl.³ F02D *11/10*
U.S. Cl. 123—335 **5 Claims**



1. A device for the control of the traveling speed of a motor vehicle with a regulating unit actuatable by the vehicle driver, particularly a gas pedal, and means for transmission of the movement of the same to an element, particularly the throttle valve, which influences the fuel-air mixture, comprising

a regulating unit,

a first electrical position encoder being coupled with said regulating unit, said first position encoder having an output with an output signal,

means for influencing the air-fuel mixture of the vehicle,

an electrical adjusting device including a positioning actuator, the latter being connected with said means,

a second electrical position encoder being coupled with said positioning actuator, said second electrical position encoder having an output with an output signal,

an electrical controller including said electrical adjusting device and having a desired value input connected with the output of said first electrical position encoder and having an actual value input connected with the output of said second electrical position encoder, and wherein

the vehicle includes an ignition circuit, the device further comprising

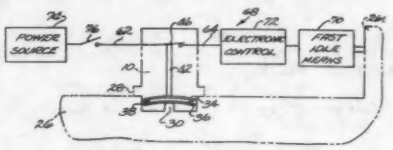
means for interrupting the ignition circuit of the motor vehicle upon a deviation of the output signal of said second electrical position encoder from the output signal of said first electrical position encoder by a certain predetermined amount.

4,393,834

TWO-TEMPERATURE THERMALLY RESPONSIVE FAST IDLE CONTROL SWITCH

John Doherty, Jr., Assonet, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 216,708, Dec. 15, 1980, Pat. No. 4,350,967.
This application Feb. 12, 1982, Ser. No. 348,478
Int. Cl.³ F02D *1/04*
U.S. Cl. 123—339 **2 Claims**



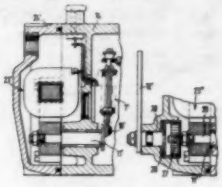
1. A fast idle control system for an automotive engine comprising fast idle means, electrically operable control means for actuating the fast idle means, an electrical power source, and a thermally responsive electrical switch connected to the power source and mounted in heat-transfer relation to the engine for operating the control means to actuate the fast idle means when the engine is below a first temperature during engine warm-up, to deactuate the fast idle means when the engine is heated to said first temperature during normal running of the engine, and to reactuate the fast idle means when the engine is heated above a second temperature during extended idling operation of the engine, characterized in that, the thermally responsive electrical switch comprises a thermally conducting housing having a well with an open end and a closed end mounted in heat transfer relation to the engine, first and second thermally responsive dished disc elements of thermostat metal each adapted to move with snap action from an original dished configuration to an inverted dished configuration at said respective first and second temperatures, said elements being disposed in the housing well in facing relation to each other with peripheral portions of the elements aligned with each other and with one of the elements resting on the closed end of the well, spacer means disposed between the peripheral portions of the elements, switch means having first and complementary contact means thereon mounted in the open end of the housing well, the first contact means being movable between an open circuit position spaced from the complementary contact means and a closed circuit position engaging the contact means, the contact means being electrically connected to the power source and said control means respectively for providing a signal to the control means corresponding to the circuit position of the contact means, and motion transfer means movably mounted between the other thermally responsive disc element and the first contact means for permitting the first contact means to be in one of said circuit positions at a temperature below said first temperature and then to move to the other circuit position and to return to said one circuit position in sequence as the engine is successively heated to said first and second temperatures.

4,393,835

RPM GOVERNOR FOR A FUEL INJECTION PUMP

Franz Eheim, Stuttgart, and Gerald Höfer, Weissach-Flacht, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 81,285, Oct. 2, 1979, Pat. No. 4,325,337.
This application Dec. 28, 1981, Ser. No. 334,715
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1978, 2845096
Int. Cl.³ F02D *31/00*
U.S. Cl. 123—357 **4 Claims**



1. In an rpm governor for a fuel injection pump of an internal combustion engine which includes

a quantity adjustment means for determining the quantity of fuel injected, said quantity adjustment means being movable along a predetermined path between a first position at which a maximum quantity of fuel is injected and a second position at which a minimum quantity of fuel is injected,

a first shaft,

a governor lever means for positioning said quantity adjustment means, said governor lever means being pivotable about said first shaft and coupled to said quantity adjustment means,

an rpm adjuster means for exerting a force on said governor lever means proportional to the rpm of the internal combustion engine,

restoring force means for exerting a force on said governor lever means counter to the force exerted on said governor lever means by said rpm adjuster means,

a second shaft having opposite ends defining an axis therebetween, said second shaft being pivotably mounted for rotation about its axis;

a first pin, disposed eccentrically on said second shaft;

an adjustment lever means, connected to said second shaft for arbitrary pivotal movement of said second shaft; and

a governor spring, connected at one end to said first pin and at an opposite end to said governor lever means; and a rotary electromagnet having an armature which is engaged with said second shaft to vary the setting of said rpm governor.

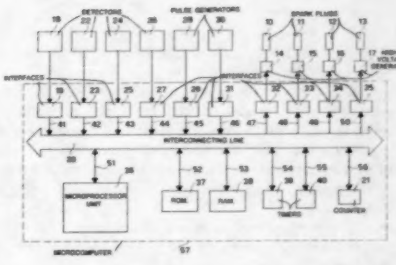
4,393,836

SYSTEM FOR THE REGULATION AND CONTROL OF THE ANGLE OF ADVANCE FOR THE IGNITION UNIT OF AN INTERNAL COMBUSTION ENGINE

Giancarlo De Angelis, Milan; Alberto Catastini, Corsico; Aldo Bassi; Edoardo Rogora, both of Milan; Dario Radaelli, Legnano; Luciano Bertoloni, Milan, and Francesco Perrone, Novara, all of Italy, assignors to Alfa Romeo, S.p.A., Milan, Italy

Filed Sep. 2, 1980, Ser. No. 183,586
Claims priority, application Italy, Sep. 10, 1979, 25585 A/79
Int. Cl.³ F02D *5/00*; F02B *3/10*
U.S. Cl. 123—417 **4 Claims**

1. System of regulation and control of an ignition advance for an ignition unit of an internal combustion engine, the engine comprising a mainshaft, engine sparking plugs, means for generating high-voltages, means for distributing said high-voltage to said sparking plugs according to an explosion sequence, at least a power stage for driving said high voltage generating means, said regulation and control system comprising a first detector of a first engine operative parameter capable of delivering in a discrete number values provided by said first parameter, each of said values comprising a preselected number of bits; a second detector of a second engine operative parameter capable of delivering in a discrete number values provide by said second parameter, each of said values of said second parameter comprising a preselected number of bits; each combination of the values of said first and second parameters identifying a preselected operative condition of said engine; a third detector for detecting a working temperature of said engine and being capable of delivering in a discrete number values provided by said working temperature, each of said values of said working temperature comprising a preselected number bits; a first pulse generator operatively connected to said engine mainshaft and being capable of delivering at every revolution of said engine mainshaft a pulse signal comprised of a number of pulses equal to the number of ignition events which must be commanded in a revolution of said engine, each of said pulses having a preselected phase angle relationship relative to the engine top dead center; a second pulse generator operatively connected to a second engine shaft rotated at a speed equal to one half the speed of said engine mainshaft and being capable of delivering a properly phased pulse at every engine cycle; a central microprocessor unit (C.P.U.); a reading and writing storage unit (RAM); a plural storage cell reading only storage unit (ROM) containing calculation programs of said microprocessor unit, a preselected controlled advance of said ignition of said engine as a function of said two engine operative parameters, a preselected control of correction of said



ignition advance as a function of said working temperature of said engine; said storage cells of said storage units (ROM) relative to said preselected control of ignition advance each containing an information piece comprised of a preselected number of bits, the value of which is a function of an angle of ignition advance of a selected sparking plug relative to said piston top dead center position in the operative condition defined by a combination of said values of aforesaid two engine operative parameters, and all the other engine operative parameters being considered to be constant; the number of said storage cells being equal to the number of the possible combinations of values provided by a preselected number of most significant bits of said first engine operative parameter with values provided by a preselected number of most significant bits of said second engine operative parameter; said cells of said storage unit (ROM) relative to said preselected control of correction of said ignition advance each containing a piece of information the value of which is an ignition advance correction coefficient defined as a function of said values provided by said engine working temperature; said system comprising at least one timer operatively connected to said central microprocessor unit (C.P.U.) and to said at least one power stage; said central microprocessor unit being programmed for generating an address of said reading only storage (ROM), including the combination of said preselected number of said first most significant bits of said value provided by said first engine operative parameter with said preselected number of said most significant bits of said value provided by said second engine operative parameter forming means for:

identifying by said address that storage cell of said reading only storage in which is contained a first information of said angle of ignition advance;

identifying in said reading only storage in addition to said first information of said angle of ignition advance, three additional pieces of information of said angle of ignition advance, each of which pieces of information corresponds to the contents of said storage cells situated in a predetermined area around said address, each of said three storage cells being identified by algebraically summing preselected constants to said address;

obtaining from said four pieces of information of said angle of advance of ignition an information of angle of ignition advance calculated by an iterative process of interpolation, an elementary operative module of which utilizes a preselected number of said least significant bits of each of said first and second engine operative parameters;

identifying in said reading only storage the storage cell containing said correction coefficient corresponding to said engine working temperature, and for utilizing said correction coefficient to modify according to a preselected procedure said calculated angle of ignition advance information;

calculating from said information of angle of advance of ignition relative to said piston top dead center position; corrected for said engine temperature, information of delay time relative to a first pulse delivered by said first pulse generator, said information of delay time being expressed in the form of a number of constant-frequency pulses;

identifying the sparking plug on which said spark must occur, through said pulsed signal delivered by said first pulse generator;

controlling actuating of said power stage of said high voltage generating means of said identified sparking plug utilizing said timer, so that the same high voltage generating means may start the storage of electricity, the instant of time of actuation of said power stage being determined through said pulsed signal delivered by said first pulse generator; and

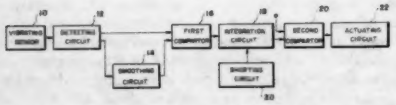
controlling the deactuation of said power stage so as to have said spark occurring on said identified sparking plug as a function of said delay time utilizing said timer.

4,393,837

SPARK TIMING CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Kunihiko Sugihara, Takasho, and Michio Onoda, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 30, 1980, Ser. No. 173,811
Claims priority, application Japan, Aug. 6, 1979, 54-100115
Int. Cl.³ F02P 5/04
U.S. Cl. 123—425 **18 Claims**



1. A spark ignition timing control system for use with an internal combustion engine comprising:

(a) a first means for sensing engine vibration magnitude, and for comparing said sensed vibration magnitude with a first predetermined value and generating an output signal when said sensed vibration magnitude is greater than said first predetermined value;

(b) a second means for comparing the output signal of said first means with a second predetermined value and generating a knocking signal when the output signal of said first means is greater than said second predetermined value;

(c) a third means for adjusting the engine spark advance angle in response to said knocking signal; and

(d) a fourth means for detecting an unstable engine condition and interrupting operation of said third means in response thereto,

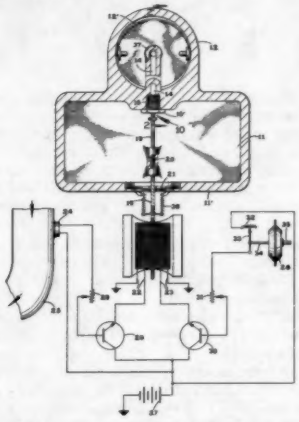
whereby upon the occurrence of an unstable engine condition said engine spark advance angle adjustment is suspended.

4,393,838

THERMAL AND VACUUM TRACKING CARBURETOR JET WITH ELECTRONIC CONTROL

Ralph P. Muscatell, 2007 NE. 20th Ave., Ft. Lauderdale, Fla. 33305

Filed Oct. 23, 1981, Ser. No. 314,247
Int. Cl.³ F02M 7/00, 1/04
U.S. Cl. 123—435 **5 Claims**



1. In a carburetor, a device for the porportional mixing of fuel and air for induction into an internal combustion engine, comprising:

means for defining a fuel chamber;

a fuel mixing conduit having an air inlet at one end, a fuel/air outlet at the opposite end and a venturi throat between said inlet and said outlet;

a fuel metering valve operatively arranged to discharge fuel into said throat;

an orifice operatively connected between said fuel chamber and said valve to supply fuel to said valve;

a rod and stem adjustable positioned at said orifice to control the flow of fuel therethrough;

means responsive to the engine manifold vacuum to adjust said rod and stem in a direction to increase the flow of fuel to said valve when the engine vacuum diminishes and in the opposite direction to decrease the flow of fuel to said valve when the engine vacuum increases;

means responsive to the engine exhaust temperature to adjust said rod and stem in a direction to increase the flow of fuel to said valve when the engine exhaust temperature increases and in the opposite direction to decrease the flow of fuel to said valve when the engine exhaust temperature decreases, whereby the richness of the fuel/air mixture is controlled jointly by the engine vacuum and the engine exhaust temperature;

the improvement wherein:

said temperature responsive means comprises an electric linear drive motor means for driving said valve member to control the flow of fuel at said fuel metering valve;

thermistor means electrically responsive to the engine exhaust temperature to provide a variable resistance; and

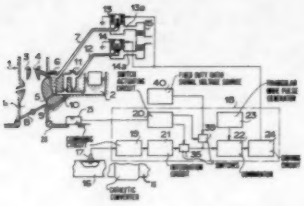
circuit means including amplifier means coupling said thermistor means to said electric linear drive motor means for supplying an electric current to said electric linear drive motor means which varies in proportion to the resistance of said thermistor means to provide said bi-directional movement of said fuel metering valve.

4,393,839

SYSTEM FOR CONTROLLING AN AIR-FUEL RATIO

Ryuji Kataoka, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan

Filed Aug. 1, 1980, Ser. No. 174,372
Claims priority, application Japan, Aug. 2, 1979, 54-98919
Int. Cl.³ F02M 7/12
U.S. Cl. 123—440 **6 Claims**



1. In a system for controlling the air-fuel ratio for a carburetor of an internal combustion engine having an induction passage, a throttle valve in said induction passage, an exhaust passage, detecting means for detecting the concentration of a consistent of exhaust gases passing through said exhaust passage and providing a detecting output signal dependent thereon, air-fuel mixture supply means for supplying the air-fuel mixture to the induction passage, including an on-off type electromagnetic valve for correcting the air-fuel ratio of the air-fuel mixture supplied by said air-fuel mixture supply means, the improvement comprising

a comparing circuit means for comparing the detecting output signal of said detecting means with a reference value corresponding to a stoichiometric air-fuel ratio value and for producing a first output signal dependent on the difference,

an integration circuit means responsive to said first output signal for producing an integration output signal,

a driving circuit means for producing a driving output for driving said type on-off type electromagnetic valve dependent on the integration output signal of said integration circuit means for controlling the air-fuel ratio to a value approximately equal to the stoichiometric air-fuel ratio,

a constant signal generating circuit means for producing a constant signal selectively operating said on-off type electromagnetic valve at a predetermined duty ratio via said driving circuit means,

a first switch connecting said integration circuit means with said driving circuit means,

a second switch connecting said constant signal generating circuit means with said driving circuit means,

means comprising a vacuum switch in said induction passage for sensing only such a high vacuum occurring in a rapid deceleration condition of said engine that would cause misfiring, and

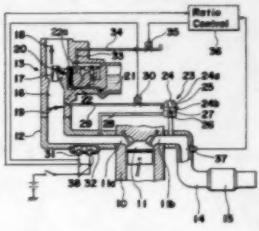
a switch actuating circuit means responsive to the output of said vacuum switch for producing a second output signal for opening said first switch and closing said second switch, said switch actuating circuit means includes a R.S. flip-flop output stage and a control circuit input stage connected to each other, whereby said driving circuit means is operated by the constant signal from said constant signal generating circuit means for driving said on-off type electromagnetic valve at said predetermined duty ratio.

4,393,840

FUEL CONTROL SYSTEM FOR AUTOMOBILE ENGINE

Hideki Tanaka, and Kazutoshi Otsuka, both of Hiroshima, Japan, assignors to Tokyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Aug. 26, 1980, Ser. No. 182,405
Claims priority, application Japan, Aug. 31, 1979, 54/112252
Int. Cl.³ F02B 33/00; F02M 17/00
U.S. Cl. 123—440 **6 Claims**



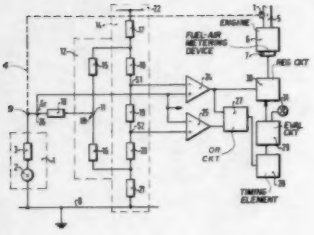
1. In an automobile fuel control system for an automobile internal combustion engine comprising a source of combustible air-fuel mixture, a mixture intake passage means for supplying the combustible air-fuel mixture from the mixture source to the combustion engine, and exhaust passage means including a catalytic converter which provides simultaneous oxidization of unburned fuel and a reduction of nitrogen oxides, said automobile fuel control system including a composition sensor for detecting the concentration of a particular component of the exhaust gases emitted from the engine, a mixing ratio control means including a compensator for compensating for variations of the air-fuel mixing ratio of the combustible air-fuel mixture, said mixing ratio control means being operable in response to an output signal from the composition sensor to cause the compensator to operate, and an exhaust gas recirculating means including a recirculating passage for communicating the exhaust passage means to the mixture intake passage means and including a control valve means for establishing and interrupting the communication between the exhaust passage means and the intake passage means through the recirculating passage, the improvement which comprises a temperature detector for detecting the temperature of the engine and for generating a first temperature signal when the detected temperature of the engine is equal to or higher than a first predetermined value and for generating a second temperature signal when the detected temperature of the engine subsequently becomes equal to or higher than a second predetermined value which is higher than the first predetermined temperature as a result of warm-up of the engine, said control valve means being held in position to establish the communication between the exhaust passage means and the intake passage means in response to the generation of the first temperature signal, said mixing ratio control means being operated in response to the generation of the second temperature signal to cause the compensator to compensate for variations of the air-fuel mixing ratio of the combustible air-fuel mixture being supplied to the engines wherein said air-fuel mixture supplied to said engine is enriched prior to the generation of said second temperature signal when said engine is cold started.

4,393,841

DEVICE FOR REGULATING THE FUEL-AIR RATIO IN INTERNAL COMBUSTION ENGINES

Ulrich Drews, Vaihingen; Peter Werner, Wiernsheim, and Werner Möhrle, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 24, 1981, Ser. No. 276,760
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024607
Int. Cl.³ F02B 3/08
U.S. Cl. 123—440 5 Claims



1. A system for regulating the fuel-air mixture ratio being combusted in an internal combustion engine, the system having

a lambda sensor having an internal resistance;

a regulating device connected to the internal combustion engine to regulate the fuel-air ratio;

a regulating circuit for controlling said regulating device;

a monitoring circuit connected to said lambda sensor for generating a signal indicating lambda sensor readiness as a function of said internal resistance; said monitoring circuit including:

a resistor connected at a first end to said lambda sensor and connected at a second end to said monitoring circuit for generating a resultant voltage at the first end of said resistor;

two comparator devices having different threshold values which are connected to said lambda sensor to receive said resultant voltage and to compare said resultant voltage to said respective threshold values and to thereby generate respective output signals indicative of said comparison;

a logic processing circuit connected to receive said outputs of said two comparator devices for producing an output;

an evaluation circuit connected to receive said logic processing circuit output and connected to said regulating circuit for generating a lambda sensor readiness signal to operate said regulating device and a lambda sensor non-readiness signal to shut off said regulating device whereby said system is switched to open-loop control according to said logic processing circuit output, said system further including:

a voltage source connected to said monitoring circuit;

a first voltage divider connected across said voltage source;

a second voltage divider, connected parallel to said first voltage divider and having a pickup-point; and

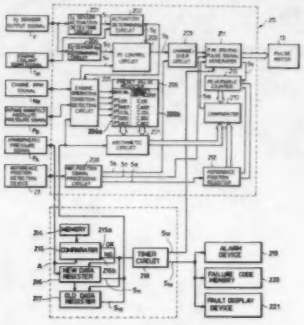
wherein said resistor has a high resistance value and connects said pickup-point with said lambda sensor.

4,393,842

AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES, HAVING ATMOSPHERIC PRESSURE COMPENSATING FUNCTION

Kazuo Otsuka, Higashikurume; Shin Narasaka, Yono, and Shumpei Hasegawa, Niiza, all of Japan, assignors to Honda Motor Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1981, Ser. No. 286,880
Claims priority, application Japan, Jul. 28, 1980, 55-103315
Int. Cl.³ F02B 33/00
U.S. Cl. 123—440 6 Claims



1. An air/fuel ratio control system for performing feedback control of the air/fuel ratio of a mixture being supplied to an internal combustion engine, which comprises: an O_2 sensor for detecting the concentration of oxygen present in exhaust gases emitted from said engine; fuel quantity adjusting means for producing said mixture being supplied to said engine; and an electrical circuit operatively connecting said O_2 sensor with said fuel quantity adjusting means in a manner effecting feedback control operation in response to an output signal produced by said O_2 sensor to control the air/fuel ratio of said mixture to a first predetermined preset value, said electrical circuit including means for interrupting said feedback control operation when said engine comes into a predetermined operating condition, means responsive to said interruption of said feedback control operation to control said fuel quantity adjusting means so as to obtain an air/fuel ratio of said mixture equal to a second predetermined preset value corresponding to said predetermined engine operating condition irrespective of the value of the output signal of said O_2 sensor, and means for correcting said second predetermined preset value as a function of atmospheric pressure.

4,393,843

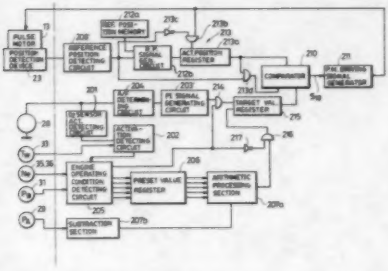
AIR-FUEL RATIO FEEDBACK CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES, HAVING FUNCTION OF CORRECTING POSITION OF AIR/FUEL RATIO CONTROL VALVE ACTUATOR

Kazuo Otsuka, Higashikurume; Shin Narasaka, Yono, and Shumpei Hasegawa, Niiza, all of Japan, assignors to Honda Motor Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,528
Claims priority, application Japan, Aug. 7, 1980, 55-108507
Int. Cl.³ F02M 7/18
U.S. Cl. 123—440 2 Claims

1. In an air/fuel ratio feedback control system for performing feedback control of the air/fuel ratio of an air/fuel mixture being supplied to an internal combustion engine, which includes means for detecting the concentration of an exhaust gas ingredient emitted from the engine, fuel quantity adjusting means for producing the mixture being supplied to said engine, means operatively connecting said concentration detecting means with said fuel quantity adjusting means in a manner effecting feedback control operation to control the air/fuel

ratio of said mixture to be a predetermined value, said connecting means comprising an electrical circuit, valve means for varying the air/fuel ratio of said mixture, and a pulse motor arranged to be controlled by said electrical circuit for driving said valve means, the combination comprising position detecting means for producing an output when said pulse motor is at a predetermined reference position which is set within a movable range of said pulse motor, a memory storing a value indicative of said predetermined reference position for said pulse motor, a first register responsive to an output signal of said



concentration detecting means, indicative of the concentration of said exhaust gas ingredient, to make accessible a predetermined desired value for said pulse motor, a second register storing a value indicative of an actual position of said pulse motor, means for driving said pulse motor until said actual position value in said second register becomes equal to said predetermined desired value, and means responsive to said output of said position detecting means to cause shifting of said predetermined reference position value stored in said memory to said second register to replace the value stored in the latter by said predetermined reference position value.

4,393,844

LIQUID FUEL PUMPING APPARATUS

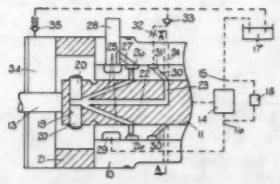
Robert T. J. Skinner, High Wycombe, England, assignor to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 153,780, May 27, 1980, abandoned. This application Nov. 8, 1982, Ser. No. 439,815

Claims priority, application United Kingdom, Jul. 6, 1979, 7923685

Int. Cl.³ F04B *23/10, 19/02*

U.S. Cl. 123—450 **1 Claim**



1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine and comprising a body part which defines a cavity, a rotary distributor member located in the body part and arranged in use, to be driven in timed relationship with the associated engine, a transverse bore formed in the distributor member, a pair of plungers in the bore, the outer end of said plungers being exposed within said cavity, a delivery passage extending from said bore to a first axial position on the periphery of the distributor member, an outlet in the body part positioned to register with the delivery passage during inward movement of the plungers as the distributor member rotates and while the delivery passage is in communication with the outlet, a supply passage in the distributor member, said supply passage communicating with the bore and extending to a second axial position on the periphery of the distributor member which is axially spaced from said first position, a supply port formed in the body part for communication with said supply passage during at least part of the time between successive inward movements of the plungers, a source of fuel under pressure, an adjustable throttle through which fuel from the source can flow to the supply port, a further port formed in the body part, said further port being positioned at said first axial position for registration with said delivery passage during at least part of the time said supply port is in communication with said supply passage whereby a flow of fuel together with any air, can take place along the supply passage, along the delivery passage and through said further port, and valve means for pressurizing fuel leaking into said cavity whereby when said throttle is closed to prevent fuel flow to said bore, said plungers will be moved inwardly their maximum extent to prevent actuation thereof by said cam means.

4,393,845

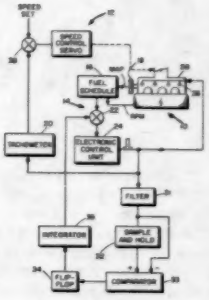
MEANS FOR IMPROVING THE EFFICIENCY OF AN INTERNAL COMBUSTION ENGINE

William R. Seitz, Royal Oak, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 3, 1978, Ser. No. 892,722

Int. Cl.³ F02D *5/02*

U.S. Cl. 123—478 **11 Claims**



1. In an internal combustion engine having means for controlling the speed thereof and having an electronic fuel injection system which meters fuel to the engine in proportion to the width of pulses applied to engine fuel injectors, said fuel injection system establishing the width of said fuel injector pulses as a function of ambient engine operating parameters, wherein the improvement comprises:

means for increasing the efficiency of operation of said engine including;

means for varying in either a positive or negative sense the width of said fuel injector pulses established by said fuel injection system;

means for maintaining the speed of said engine constant;

means providing a quantity proportional to the width of said injector pulses;

means for periodically sampling and storing said quantity;

means for comparing an instantaneous value of said quantity with said stored value of said quantity to determine which of said compared values is of greater magnitude; and

means for reversing the sense of pulse width variation produced by said pulse width varying means whenever said comparing means indicates that the sense of change in said pulse width is in the direction of increased fuel consumption by said engine.

4,393,846

FUEL PUMPING APPARATUS

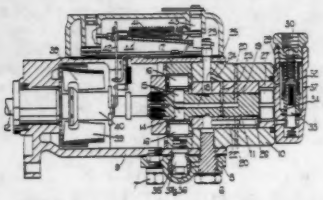
Durian F. Mowbray, Burnham; Ivor Fenne, Greenford, and Eric J. Cavanagh, Surbiton, all of England, assignors to Lucas Industries Limited, Birmingham, England

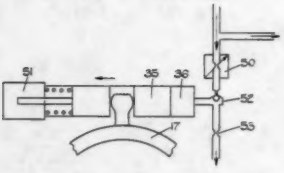
Filed Jan. 30, 1981, Ser. No. 230,269

Claims priority, application United Kingdom, Feb. 15, 1980, 8005266

Int. Cl.³ F02M 59/20

U.S. Cl. 123—502 4 Claims





1. A fuel pumping apparatus for supplying fuel to an internal combustion engine comprising an injection pump operable in use in timed relationship with an associated engine, fluid pressure operable means for adjusting the timing of delivery of fuel by the apparatus comprising a member against a surface of which fluid under pressure can act, and resilient means opposing the movement of the member by said fluid pressure, a low pressure fuel supply pump for supplying fuel to the injection pump, an adjustable throttle for varying the quantity of fuel supplied to the injection pump, a transducer associated with the throttle valve for providing a first signal indicative of the effective flow area of the throttle valve throughout the range of movement thereof, an electrical circuit which receives said first signal, a second signal indicative of the speed of operation of the apparatus and a third signal indicative of the fuel pressure upstream of the metering valve and from which is determined a fourth signal representing the amount of fuel supplied to the injection pump, means responsive to at least said second and fourth signals for providing a fifth signal to vary the timing of delivery of fuel by the apparatus, an error amplifier to which said fifth signal is supplied, a further transducer for providing a sixth signal representative of the position of said fluid pressure operable means, said sixth signal being supplied to said error amplifier, an actuator responsive to the output of said error amplifier for controlling the pressure applied to said fluid pressure operable means, said actuator controlling the size of a restrictor through which fluid under pressure from a source is applied to said surface, said source of fluid pressure being said low pressure fuel supply pump and including a branch passage from downstream of said restrictor and through which fuel is supplied to the injection pump under the control of said throttle valve.

4,393,847

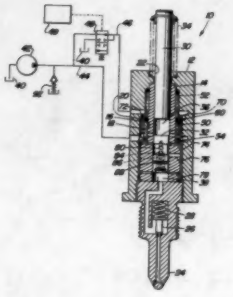
LOW PRESSURE SEALING ARRANGEMENT FOR A FUEL INJECTOR

Charles W. May, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 25, 1982, Ser. No. 361,680

Int. Cl.³ F02M 47/02

U.S. Cl. 123—502 5 Claims



1. A low pressure sealing arrangement for a fuel injector comprising:

(a) a housing containing a cylindrical barrel therein and having an annular cavity formed between an inner surface of said housing and an outer surface of said barrel, said barrel also having a bore formed therein;

(b) a plunger and a piston spaced therefrom, said plunger and piston being positioned within said bore for axial movement;

(c) a nozzle situated at one end of said bore remote from said plunger for releasing fuel into a combustion chamber of an engine;

(d) a timing chamber defined in said bore between said plunger and said piston being adapted to receive pressurized fluid for creating a coupling between said plunger and said piston;

(e) a metering chamber defined in said bore between said piston and said nozzle;

(f) passages formed in said housing and said barrel for receiving pressurized fluid and transmitting said fluid into said timing chamber, into said metering chamber and into opposite ends of said annular cavity;

(g) control means for varying the flow of pressurized fluid through one of said passages and into one of said annular cavity;

(h) a pressure activated valve arranged in said annular cavity and movable by fluid pressure between an open position permitting fluid flow from said pressurized source into said timing chamber and a closed position preventing fluid flow from said pressurized source to said timing chamber;

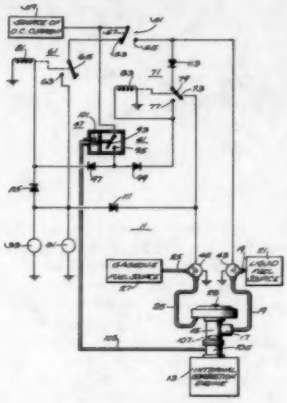
(i) a cylindrical sleeve concentrically arranged about said pressure activated valve within said annular cavity for providing a first low pressure seal against an outer surface of said pressure activated valve; and

(j) means for axially urging an end of said cylindrical sleeve against a surface of said annular cavity to provide a second low pressure seal therewith, said first and second seals preventing leakage of fuel from said timing chamber during periods of increased pressure while permitting rapid movement of said pressure activated valve between said open and closed position with a minimal amount of drag forces acting thereon.

4,393,848
CONTROL MECHANISM FOR SELECTIVELY OPERATING AN INTERNAL COMBUSTION ENGINE ON TWO FUELS

Arthur G. Poehlman, Oconomowoc, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 23, 1981, Ser. No. 314,225
Int. Cl.³ F02M 21/02
U.S. Cl. 123—525 6 Claims



1. Apparatus for controlling operation of an internal combustion engine which is selectively operable using gaseous fuel or liquid fuel, said apparatus comprising a gaseous fuel supply line extending between the engine and a source of gaseous fuel, a liquid fuel supply line extending between the engine and a source of liquid fuel, and means for controlling supply to the engine of the gaseous fuel and the liquid fuel, said control means including an operator controlled fuel selector switch movable between a gaseous fuel position and a liquid fuel position, said control means being operable following prior engine operation with gaseous fuel and in response to movement of said fuel selector switch from said gaseous fuel position to said liquid fuel position for permitting liquid fuel flow through said liquid fuel supply line, for permitting continued gaseous fuel flow through said gaseous fuel supply line until initiation of liquid fuel combustion, and for thereafter preventing further gaseous fuel flow through said gaseous fuel supply line until repositioning of said fuel selector switch to said gaseous fuel position, said control means also being operable following prior engine operation with liquid fuel and in response to movement of said fuel selector switch from said liquid fuel position to said gaseous fuel position for preventing further liquid fuel flow through said liquid fuel supply line, for preventing gaseous fuel flow through said gaseous fuel supply line until termination of liquid fuel combustion, and for thereafter permitting gaseous fuel flow through said gaseous fuel supply line until repositioning of said fuel selector switch to said liquid fuel position.

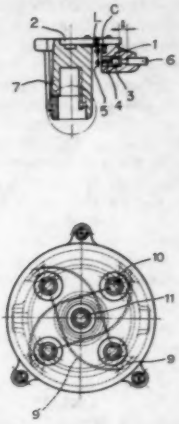
4,393,849
VARIABLE IGNITION DISTRIBUTOR

Kim J. Sae, 11-43 Daebang-Dong, Dongjak-Gu, Seoul, Rep. of Korea

Filed Apr. 24, 1981, Ser. No. 257,174
Claims priority, application Rep. of Korea, May 10, 1980, 80-1843[U]
Int. Cl.³ F02M 27/04; F02P 15/00
U.S. Cl. 123—536 11 Claims

1. A variable ignition distributor for furnishing a high-voltage spark to a spark plug in a first cylinder to initiate an explosion of a fuel-air mixture therein and for furnishing a low voltage spark to a spark plug in a second cylinder to enhance ionization of fuel supplied to the second cylinder prior to explosion of the fuel-air mixture in the second cylinder, said variable ignition distributor being usable with a distributor cap connected to an ignition coil and connected to the spark plugs in the first and the second cylinders and comprising:

a rotor disposed within the distributor cap;



an ignition electrode carried by said rotor for transferring a high voltage spark from the ignition coil to the spark plug in the first cylinder;

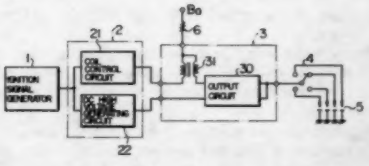
circuit means responsive to transfer of said high voltage spark for generating a low voltage spark; and

a variable electrode carried by said rotor for transferring said low voltage spark to the second cylinder.

4,393,850
IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Minoru Nishida; Tadashi Hattori, and Akira Tanaka, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 1, 1981, Ser. No. 279,516
Claims priority, application Japan, Jul. 10, 1980, 55/95887
Int. Cl.³ F02P 15/02, 15/10, 15/00
U.S. Cl. 123—536 9 Claims



1. An ignition system for an internal combustion engine having a plurality of spark plugs comprising:

an ignition coil including a primary coil and a secondary coil for generating a secondary voltage including a high voltage generated by interruption of a primary coil current, said secondary voltage reaching a dielectric breakdown voltage of a gap between discharge electrodes of any one of said spark plugs to cause a capacitive discharge therebetween;

a DC high voltage generating circuit for generating a DC

high voltage which is, in absolute value magnitude, lower than the dielectric breakdown voltage and higher than a voltage required to sustain discharge between the discharge electrode gap during a predetermined time interval from before occurrence of the capacitive discharge to a predetermined time or a predetermined crank angle thereafter;

said DC high voltage generating circuit including memory means for storing a plurality of predetermined time periods corresponding to a plurality of engine conditions and for generating a signal indicative of one of said time periods in response to a detected engine condition, and a circuit responsive to said output signal of said memory means to determine said predetermined time interval after the beginning of the capacitive discharge, whereby the time of interrupting said DC high voltage is determined in dependence on the detected engine condition;

an output circuit for selectively applying one of the secondary voltage and the DC high voltage to the discharge electrode gap in accordance with relative levels of both voltages; and

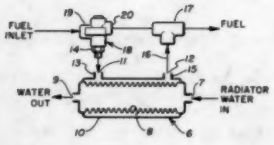
an ignition coil control circuit for controlling supply and interruption of the primary coil current.

4,393,851

DIESEL FUEL TEMPERATURE CONTROLLING APPARATUS

Marc S. Gorans, Willmar, Minn., assignor to Phillips Temro, Inc., Eden Prairie, Minn.

Filed Jan. 14, 1981, Ser. No. 224,917
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **14 Claims**



1. Apparatus for controlling the temperature of liquid fuel flowing in a fuel supply line while maintaining the same in liquid form comprising:

(a) fuel conduit structure having fuel inlet and outlet passages;

(b) a fuel-heating heat exchanger having heat exchange surfaces which define a fuel passageway connected in fuel communicating relation with said inlet and outlet passages;

(c) fluid conduit means defining a bypass passageway communicating with said inlet and outlet passages and effective to bypass fuel from said fuel conduit structure through said heat exchanger;

(d) thermostatic valve means for modulating the flow of such fuel through said passageways in response to temperature of unmixed and unheated bypassed fuel in said fuel conduit structure; and

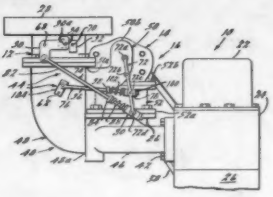
(e) said valve means being constructed and arranged within said fuel conduit structure to direct the flow of fuel through said conduit structure when the fuel supply entering said inlet is warm and through said fluid conduit means and said heat exchanger when the fuel supply entering said inlet is cold.

4,393,852

LINKAGE MECHANISM FOR SUPERCHARGER SYSTEM

Robert C. Merritt, Corning, N.Y., and Gerald L. Terwilliger, Wixom, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 8, 1980, Ser. No. 214,305
Int. Cl.³ F02B *33/44*; F02D *23/00*
U.S. Cl. 123—564 **21 Claims**



1. In an induction system including an inlet receiving air, an outlet adapted to deliver the air to an expansible combustion chamber of an engine, first and second air flow paths connected in parallel between the inlet and outlet, a supercharger interposed in the second path; the improvement comprising:

valve means including a valving member and means responsive to differential pressure between the inlet and outlet,

said valving member moveable between open and closed positions to control air flow in said first path for regulating said differential pressure between a minimum and a maximum pressure, and

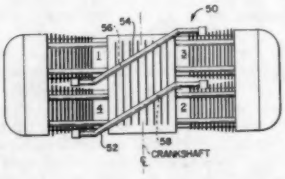
said pressure responsive means operative to move said valving member toward said first position to decrease said differential pressure in response to said outlet pressure exceeding said maximum pressure.

4,393,853

EXHAUST GAS RECIRCULATION TYPE INTERNAL COMBUSTION ENGINES AND METHOD OF OPERATING SAME

William N. Groves, Rapid City, S. Dak., assignor to Research Corporation, New York, N.Y.

Filed Aug. 6, 1981, Ser. No. 290,798
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—568 **6 Claims**



1. In a multi-cylinder internal combustion engine having a fuel and an air source connected to each cylinder via a substantially centrally located intake valve means in each cylinder; means for stratifying a combustible fuel/air mixture and exhaust gas in the cylinder during the intake stroke, said means for stratifying comprising:

(a) fuel/air mixture swirling means for each cylinder;

(b) at least one inlet port in each cylinder open to each cylinder from about 60° BBDC to about 60° ABDC;

(c) conduit means connecting each said at least one inlet port with a source of pressurized exhaust gas;

(d) said source of pressurized exhaust gas comprising the gas exhausting from the cylinder 360° apart on the firing order of the engine;

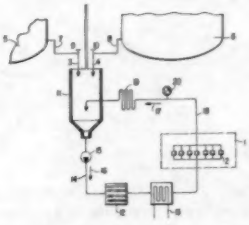
(e) means for causing the exhaust gas to swirl in each cylinder in the same direction as the swirl of the air/fuel mixture.

4,393,854

MIXING UNIT

Maurice Tacquet, 14 Allee des Pres, F-59650 Villeneuve d'Ascq, France

Filed Feb. 18, 1981, Ser. No. 235,519
Claims priority, application France, Feb. 19, 1980, 80 04386
Int. Cl.³ F02B 1/00
U.S. Cl. 123—576 5 Claims



1. An apparatus for supplying fuel to a combustion device, comprising in combination:

(a) a first tank for storing light fuel;

(b) a second tank for storing heavy fuel;

(c) a third tank;

(d) a first conduit connecting said first tank with said third tank for supplying light fuel from said first tank to said third tank;

(e) a second conduit connecting said second tank with said third tank for supplying heavy fuel from said second tank to said third tank;

(f) a third conduit connecting said third tank with said combustion device for supplying fuel from said third tank to said combustion device;

(g) a fourth conduit connecting said combustion device with said third tank for returning excess fuel from said combustion device to said third tank;

(h) a pump in said third conduit for driving fuel through said third and fourth conduits; said pump having an output flow rate that is greater than the rate of fuel consumption of said combustion device;

(i) a first valve in said first conduit for controlling the fuel flow therethrough;

(j) a second valve in said second conduit for controlling the fuel flow therethrough;

(k) a viscosity sensing means connected to said fourth conduit for sensing the viscosity of the fuel flowing therethrough and

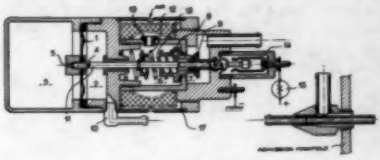
(l) control means connecting said viscosity sensing means with at least one of said valves for changing the ratio of the rates of fuel flowing in said first and second conduits in response to signals from said viscosity sensing means for maintaining the viscosity of the fuel in said third tank and in said third conduit at a predetermined value.

4,393,855

CORRECTING DEVICE FOR THE COMBUSTION OF ENGINES OF VEHICLES DURING TRANSITIONAL PHASES OF OPERATION

Andre Mandar, Creteil; Jules Fressard, Paris, and Martine Mandar, Versailles, all of France

PCT No. PCT/FR80/00058, § 371 Date Dec. 11, 1980, § 102(e) Date Dec. 11, 1980, PCT Pub. No. WO80/02179, PCT Pub. Date Oct. 16, 1980
PCT Filed Apr. 14, 1980, Ser. No. 220,040
Int. Cl.³ F02M 23/04
U.S. Cl. 123—587 10 Claims



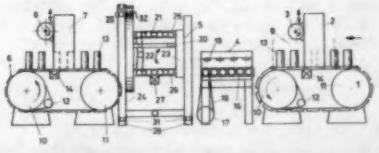
1. A device for correcting the combustion of internal combustion engines which are subjected to frequent changes in speed of rotation and loads, in particular automobile engines, each internal combustion engine having an intake manifold for directing a mixture of air and fuel to an engine comprising a first sealed chamber directly connected to said intake manifold, a second sealed chamber separated from the first chamber by a diaphragm having a neutral position, said second chamber being connected to the first chamber, through passage means for delaying transmission of pressure variations from the first chamber to the second chamber, control means for reducing the fuel to air ratio of said air and fuel mixture, said control means being coupled to said diaphragm for activation by said diaphragm whenever the differential pressure between the second and first chambers exceeds a first predetermined value and also whenever the differential pressure between the first and second chambers exceeds a second predetermined value, whereby the fuel to air ratio is reduced during acceleration and deceleration transitory phrases of the engine.

4,393,856

APPARATUS FOR MILLING BUILDING BLOCKS

Siegfried Gebhart, Tobelstadel, D-7971 Aitrach-Aichstetten, Fed. Rep. of Germany

Filed Mar. 4, 1981, Ser. No. 240,535
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009615
Int. Cl.³ B28D 1/18
U.S. Cl. 125—3 16 Claims



1. Apparatus for milling building blocks at opposite first and second sides in two steps, comprising in combination:

first means for milling said blocks at said first side thereof in a first one of said steps;

second means for milling said blocks at said second side thereof in the second one of said two steps;

third means located between said first and second means for accelerating said blocks in a direction of transportation of the blocks after said milling at said first side; and

fourth means located between one of said first and second means and said third means for turning said blocks by 180° for said milling at a second side thereof;

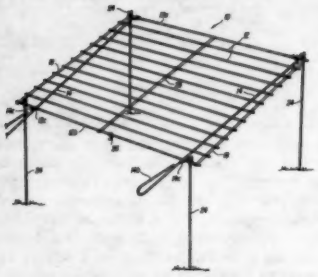
said fourth means including a box having opposite open ends, with one open end providing an entrance for blocks and the other open end an exit for the blocks, and means including a frame for mounting the box for rotation by said 180° about an axis of rotation parallel to said direction of transportation of the blocks.

4,393,857

COLLAPSIBLE GRILL

Richard Sanford, Rte. 2, Potsdam, N.Y. 13676

Filed Mar. 23, 1981, Ser. No. 246,915
Int. Cl.³ F24C *1/16*
U.S. Cl. 126—9 R **9 Claims**



1. A collapsible grid comprising:

(1) a pair of flexible cables;

(2) a plurality of rigid rods fastened at one end of each rod in ordered sequence beginning with a first rod at one end of one cable and continuing to a second rod at the other end of the one cable, and each remaining rod fastened at the other end to the other cable in like sequence with the first rod at one end of the cable and continuing to the second rod at the other end of the sequence, said second rod having a degree of flexibility;

(3) a pair of bars each connected at one end of the bar to one end of the first rod, said first rod having means near each of its ends to capture the bars between the respective cable and the said means;

(4) said bars each having a receiving hook to removably receive the second of said rod members, and said second bar having a pair of detent means respectively to receive said hooks; and

whereby when the hooks receive and engage the second bar member, the rods are under compression and the cables are under tension by spring action of the second bar to spread the rods into an array useful as a grill, and whereby when said rods are disengaged from the hooks the grill is collapsed, the bars and rods may be rolled up and retained by the cable to form a bundle.

4,393,858

COMBUSTION CONTROL SYSTEM

Keiichi Mori, Izumiohtsu; Yasukiyo Ueda, and Keijiro Mori, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 5, 1979, Ser. No. 100,529
Claims priority, application Japan, Dec. 11, 1978, 53-153498; Dec. 11, 1978, 53-153499; Dec. 12, 1978, 53-153926
Int. Cl.³ F24H *1/00*
U.S. Cl. 126—351 **5 Claims**

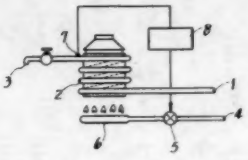
1. A combustion control system comprising:

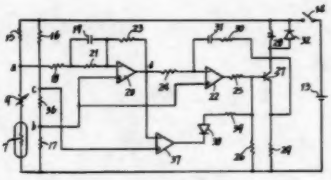
a combustion unit for a fuel;

a porportional control valve for proportionally controlling the supply of the fuel to the combustion unit;

a temperature sensor for detecting the temperature of a fluid heated with the heat of combustion produced by the combustion unit; and

a control circuit comprising a bridge circuit including the temperature sensor as a component thereof, a proportional integrating differentiating circuit comprising a proportional differentiating circuit including an operation amplifier and a proportional integrating circuit including an





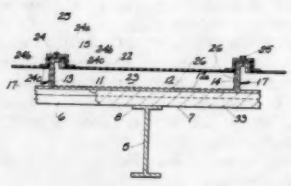
operation amplifier and an integration capacitor, the proportional integrating differentiating circuit being adapted to receive an output from the bridge circuit representative of a deviation of the fluid temperature from a first temperature setting and to give a drive output to the proportional control valve, and a discharging circuit including a comparator for comparing an output from the differentiating circuit with a second temperature setting and adapted to cause discharge of a charge from the integration capacitor when the comparison in the comparator indicates that the fluid temperature exceeds a specified level.

4,393,859

SOLAR COLLECTOR ROOF

Gabor Marossy, and Warren E. Mueller, both of Middletown, Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Feb. 19, 1980, Ser. No. 122,583
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—429 **35 Claims**



1. In a building structure of the type having a roof construction including a plurality of spaced rafters supporting a plurality of spaced generally parallel transversely extending purlins and a plurality of interlocking rigid metallic roof panels positioned on and extending between said purlins, each of said panels having a central planar portion and a web extending upwardly along opposite edges of the planar portion, each of the webs being configured to interlock with a web of an adjoin-

ing panel to form a channel-like rib, said ribs extending in generally parallel fashion between the ridge and eave of the roof, the improvement in combination therewith comprising means for converting said roof construction to a solar collector for converting solar energy impinging thereon to thermal energy including:

glazing means defined by a solar radiation transmissive sheet overlying the outer surface of the roof construction in spaced relationship therewith and being supported by said ribs at spaced points to form a plurality of duct-like air passageways between the lower surface of the solar radiation transmissive sheet and the central planar portion of the roof panels, the sides of said air passageways being formed by the inside surfaces of the channel-like ribs adjoining said central planar portion, said air passageways extending generally between the eave and ridge of the roof structure;

means associated with the upper surface of said central planar portion for converting solar radiation impinging thereon to thermal energy within the air passageway;

means for attaching said solar radiation transmissive sheet to said ribs to maintain the sheet in spaced relationship with said central planar portion comprising an elongated hat section including a planar portion and leg portions depending downwardly from the outer edges of said planar portion, said sheet being secured between said hat section and said rib, the lower ends of said leg portions operating to space the sheet from the roof surface;

inlet means for introducing air into one end of the air passageway; and

outlet means for exhausting heated air from the opposite end of the air passageway for use in the building structure interior such that air moves in a single direction between inlet and outlet within said passageway in contact with the upper surface of the panel and the lower surface of the solar radiation transmissive sheet, whereby a solar collector may be formed by using the roof surface as the solar radiation absorbing surface.

27. A method for constructing a solar roof to supply supplemental heated air to an existing building structure by retrofitting an existing conventional roof construction associated with the building of the type having a plurality of spaced rafters supporting a plurality of spaced generally parallel transversely extending metallic purlins and a plurality of interlocking rigid metallic roof panels positioned on and extending between said purlins, each of said panels having a central planar portion and a web extending upwardly along opposite edges of said planar portion, each of the webs being configured to interlock with a web of an adjoining panel to form a channel-like rib, said ribs extending in generally parallel fashion between the ridge and eave of the roof, said method comprising the steps of:

attaching to said ribs by means of a hat section including a planar portion and leg portions depending downwardly from the outer edges of the planar portion a solar radiation transmissive sheet such that the sheet is secured between the hat portion and the rib with the lower ends of the leg portions positioning the sheet in spaced overlying relationship with the outer surface of the roof construction to form a plurality of duct-like air passageways positioned between the lower surface of the solar radiation transmissive sheet and the central planar portion of the roof panels with the inside surfaces of the channel-like ribs adjoining the central planar portion of the roof panel forming the sides of the air passageway, said air passageways extending generally between the eave and ridge of the roof structure, the central planar portion of the panel serving as a solar radiation absorbing surface; and

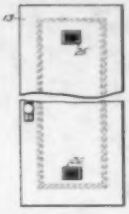
supplying means for introducing air into one end of the air passageways and for removing heated air from the opposite end of the air passageways for use within the building structure interior such that air moves in a single direction between inlet and outlet within said passageway in contact with the upper surface of the panel and the lower surface of the solar radiation transmissive sheet.

4,393,860

SOLAR HEAT COLLECTING APPARATUS

Paul M. French, 12 James St., Seekonk, Mass. 02771

Filed Nov. 24, 1980, Ser. No. 209,729
Int. Cl.³ F24J 3/02
U.S. Cl. 126—429 1 Claim



1. A hot air type solar heat-collecting apparatus comprising

(a) an upwardly extending outer door panel fitted into a wall of a building within a frame with openings therethrough at different vertical levels, said panel being so oriented as to receive the rays of the sun,

(b) a heat-collecting plate having a substantially black coating over its surface spaced from said panel and covering said openings and forming with said panel a closed heat chamber except for said openings,

(c) a heat trap cover capable of passing sun's heating rays covering said plate whereby the sun's rays will pass through said cover and impinge upon said plate and heat air in said chamber.

4,393,861

APPARATUS FOR THE UTILIZATION OF SOLAR ENERGY

Buddy M. Beard, 2856 Janelle, and Joe M. Beard, 822 E. York Way, both of Sparks, Nev. 89431

Continuation-in-part of Ser. No. 82,813, Oct. 9, 1979, abandoned. This application Oct. 1, 1981, Ser. No. 307,549
Int. Cl.³ F24J 3/02
U.S. Cl. 126—436 16 Claims

1. A system for heating an interior space of a building, the system comprising:

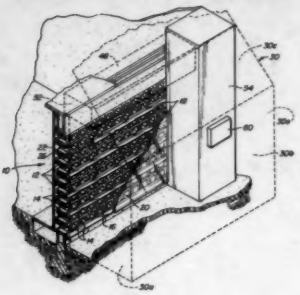
collector wall structure formed from a concrete material and having a generally interior-facing surface, an opposed exterior surface, and a plurality of apertures communicating the interior-facing and exterior surfaces to one another;

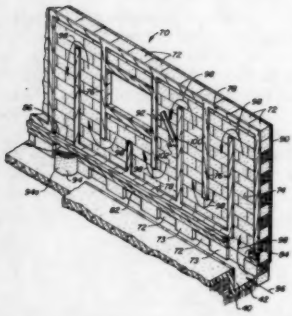
an exterior panel formed from a material transparent to solar energy, a first interior panel, and means for respectively mounting said exterior and first interior panels in spaced relation to the exterior and interior-facing surfaces of the collector wall structure to form first air passages comprising spacing between the exterior panel and the exterior surface, the first interior panel and the interior-facing surface and the plurality of apertures;

storage wall structure formed from a concrete material and having a second interior-facing surface, a second interior panel, and means for mounting the second interior panel to the second interior-facing surface to form at least a second air passage therebetween;

conduit means intercoupling the first and second air passages

for communicating air from the first air passages to the second air passage; and





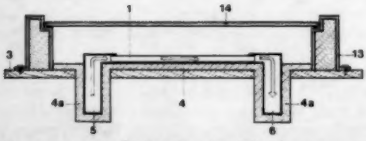
air moving means operably coupled to the conduit means for moving air from the first air passages to the second passage and back again via the conduit means.

4,393,862

SOLAR AIR DUCT

Douglas A. Wilke, Glen Head, N.Y., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 14, 1980, Ser. No. 193,581
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—448 **2 Claims**



1. In an apparatus for heating air with solar energy, wherein said air is heated in a chamber disposed below a glazing and surrounded by glazing support structure, the improvement wherein said apparatus comprises a kit capable of on-site assembly upon a planar-shaped base, and wherein said kit includes:

a. at least one prefabricated heating chamber to be placed upon said base, said chamber consisting essentially of a set of elongated, hollow, flat, straight, sheet-metal ducts, which lie flat, side-by-side, above said base when said kit is assembled; wherein each of said ducts is closed except for duct openings at each end thereof; and

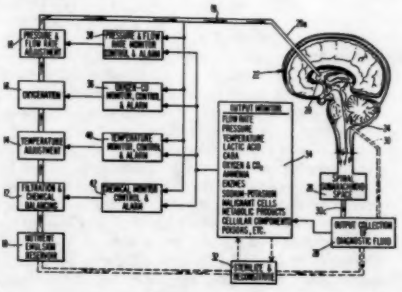
b. a first manifold chamber separate and distinct from said heating chamber to be disposed at one end of said set of ducts when said kit is assembled; a second manifold chamber separate and distinct from said heating chamber to be disposed at the other end of said set of ducts; wherein said first manifold chamber vertically extends from above said base down through a hole in said base adjacent said one end of said ducts when said kit is assembled; wherein said second manifold chamber vertically extends from above said base down through a hole in said base adjacent said other end of said set of ducts when said kit is assembled; wherein said first manifold chamber includes an aperture in its side through which said set of ducts horizontally extend when kit is assembled; wherein said second manifold chamber includes an aperture in its side through which said set of ducts horizontally extend when said kit is assembled; wherein said first and second manifold chambers each include an open-topped compartment and a lid therefor; wherein said compartment includes a protruding lip segment adjacent its open top; wherein said lid overlies said open top and lip segment when said kit is assembled; wherein said lip and overlying lid define said aperture in said manifolds through which the open ends of said ducts extend when said kit is assembled and wherein said heating chamber and manifolds are detached from said glazing and glazing support when said kit is assembled.

4,393,863

EXTRAVASCULAR CIRCULATION OF OXYGENATED SYNTHETIC NUTRIENTS TO TREAT TISSUE HYPOXIC AND ISCHEMIC DISORDERS

Jewell L. Osterholm, Radnor, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Division of Ser. No. 139,886, Aug. 14, 1980, Pat. No. 4,378,797.
This application Jun. 18, 1981, Ser. No. 275,116
Int. Cl.³ A61K *31/00*; A61M *5/14*
U.S. Cl. 128—1 R **18 Claims**



1. A method of treating hypoxic-ischemic neurologic tissue, in mammals, comprising:

(a) providing a physiologically acceptable synthetic oxygenatable fluid;

(b) oxygenating said oxygenatable fluid to produce an oxygenated fluid;

(c) injecting a substantially continuous stream of said oxygenated fluid into the cerebrospinal fluid pathway, at a first injection point;

(d) substantially continuously withdrawing fluid from said cerebrospinal fluid pathway at a second point which is selected to create a circulation of said oxygenated fluid in the vicinity of said ischemic tissue; whereby ischemic

neurologic tissue will be oxygenated and otherwise nourished by said fluid.

4,393,864

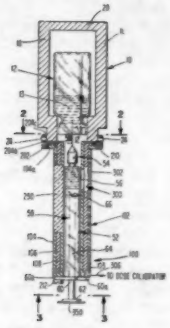
SYRINGE SHIELDS AND METHODS FOR USING SAME

Benjamin M. Galkin, Cherry Hill, N.J.; Raymond Boon, Glenolden, Pa.; Rudolph V. Gilliam, Yeadon, Pa., and Chan H. Park, Ambler, Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

Continuation of Ser. No. 121,211, Feb. 13, 1980, Pat. No. 4,307,713. This application Apr. 27, 1981, Ser. No. 257,961

Int. Cl.³ A61B *6/00*

U.S. Cl. 128—1.1 **8 Claims**



1. A hand shield for use with a syringe at least during the use of that syringe for drawing aliquots of radioactive materials from a vial, comprising a shielding disc, said disc having an aperture centrally defined therein for receiving a syringe barrel therethrough, said aperture being slightly oversized with respect to the syringe barrel to permit a rotation of the barrel axis with respect to the plane of the disc of between about 5 and 25 degrees.

4,393,865

NAPKIN FOR A YOUNG CHILD

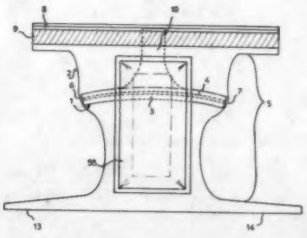
Jacques Lambert, 29 rue de la Gare, 59232 Vieux-Berquin (Nord), France

Filed Jun. 11, 1981, Ser. No. 272,756

Claims priority, application France, Oct. 15, 1980, 80 22520; Dec. 20, 1980, 80 27989

Int. Cl.³ A61F *5/00*

U.S. Cl. 128—80 A **16 Claims**



1. A napkin for an infant designed to prevent or cure an abnormality of one or both hips, such as dysplasia, subluxation of the hip or reducible and stable luxation, by binding the infant in a napkin in the abduction position comprising:

semi-rigid orientation means for positioning the legs of the infant in bent position at an angle of approximately 90° with respect to the pelvis and in abduction of about 60° while permitting movement of the legs, said semi-rigid orientation means being of the ischio-sacral type, and

means for retaining said orientation means in position, said retaining means comprising flexible fabric or plastic material which is fastened around the waist of the infant and which assures maintaining the orientation means on the thighs and pelivs of the infant,

said retaining means applying said orientation means on the pelvis and the lower rear portions of the infant's thighs and to keep the thighs flexed with respect to the pelvis, the orientation means providing a semi-elastic resistance principally to an adduction of the thighs by retaining them in, or restoring them to, the abduction position.

4,393,866

TIBIA BRACE

Alan Finnieston, 1901 NW. 17 Ave., Miami, Fla. 33125

Filed Jul. 16, 1981, Ser. No. 284,019

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—87 R **7 Claims**

1. A tibia brace to nest about and to be secured about a wearer's leg, said brace having anterior and posterior segments, extending from a point below the knee of the wearer to a point above the ankle of the wearer,

said posterior segment with an interior and an exterior main surface, said interior surface being adapted to confront the posterior surface of the leg of the wearer, said posterior segment being of relatively thin rigid plastic material and said segment having an upper end and a lower end zone, said upper end and said lower end zone being spaced from one another a predetermined distance of between about 10 inches to 14 inches, said posterior segment being generally U-shaped as seen in cross section defining a base and a pair of spaced side walls extending in generally curved relation from the base, the upper end being greater in size than the lower end zone sizing the posterior segment for mating along the leg of a wearer, each side wall having a terminal end edge spaced from one another and defining a mouth of predetermined normal unflexed dimension and yieldable to expansion or contraction to manipulate the mouth;

said anterior segment having an inside surface and an outside surface with an upper end and a lower end and being generally C-shaped as seen in cross section, said upper end and said lower end being spaced from one another a companionate distance to mate with the distance between the upper end and lower end zone of the posterior segment in clamping relation along the anterior part of the leg of a wearer;

keeper means to stabilize the segments in mating relation with one another with a portion of the anterior segment within the mouth defined by the posterior segment and in nesting relation about and along the length of the leg of a wearer to provide support around the entire periphery of the leg without gaps in the engagement of the leg and interior surfaces of the posterior and anterior segments; and

means to locate and orient the brace vertically and circumferentially with respect to the leg of a wearer and said means to locate including a portion to receive the heel of the wearer to stabilize the location of the brace, said last named means being secured to the posterior segment and said heel receiving portion extending forwardly from a point spaced vertically below the lower ends of said posterior and anterior segments and lying substantially between a downward extension of the vertical surfaces of said segments, whereby the knee and ankle joints of the wearer are unrestrained by said tibia brace and said means to locate and orient the brace supports the brace in proper vertical position on the leg of the wearer.

4,393,867

ANATOMICAL COMPRESSION DEVICE

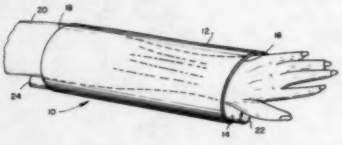
Howard C. Baron, 1222 E. 19th St., New York, N.Y. 10003

Continuation-in-part of Ser. No. 104,187, Dec. 17, 1979, Pat. No. 4,300,542. This application Sep. 30, 1981, Ser. No. 307,313

The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.

Int. Cl.³ A61F 5/04

U.S. Cl. 128—87 R **21 Claims**



1. An anatomical compression device adapted to encircle and apply a compressive force to an anatomical body part, comprising:

a completely sealed, flexible walled, expandible envelope adapted to at least partially encircle the body part;

securing means for securing said envelope in an encircling relationship around the body part; and

inflating means including a frangible member within said envelope for rapidly generating a supply of substantially only gas therein, said frangible member being accessible from the exterior of said envelope through the flexible walls thereof, whereby said frangible member may be manually ruptured to rapidly generate gas within said envelope, thereby causing said envelope to expand rapidly without further manipulation thereof and apply a compressive force to the body part.

4,393,868

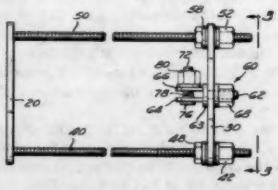
COLLES FRACTURE FIXATURE DEVICE

H. Derek Teague, Manhattan Beach, Calif., assignor to Ace Orthopedic Manufacturing Inc., Los Angeles, Calif.

Filed Feb. 20, 1981, Ser. No. 236,267

Int. Cl.³ A61F 5/04

U.S. Cl. 128—92 A **1 Claim**



1. An external fixation device for use in orthopedic surgery for fixing the angular orientation and longitudinal extent of surgical fixation pins adapted, when in use, to be secured to bone fragments for stabilizing such bone fragments during healing, comprising, in combination:

a pair of rigid arcuate support members spaced apart from each other; each of the support members generally arcuate have a generally rectangular cross-section, the major dimension of which extends, in use, generally perpendicular to the axis of the bone to be stabilized; each support member has a hole proximate each end thereof; spaced from and positioned between said holes is an arcuate slot formed from proximate one hole to proximate the other hole, the holes and the slot being formed through the support member perpendicular to said major dimension thereof;

a pair of spacing bolts extending through the holes through the support members;

means on the spacing bolts for adjusting and for fixing the spacing between the support members;

a plurality of surgical fixation pin support means, each such pin support means comprising a connector portion extending from a clevis which includes a pair of spaced clamping members each of which has an aperture formed therethrough, means cooperating with the connector portion for removably and adjustably securing the pin support means in the slot of a support member, an elongated clevis pin having formed therethrough a transverse aperture which is adapted to receive a fixation pin; the clevis pin extends through the apertures in the clevis clamping members with the aperture in the clevis pin between said clamping members; and means on said clevis pin for tightening the clamping members together on a fixation pin received in the aperture in the clevis pin so that when the device is in use, the distance and angular orientation of the bone fragment to be stabilized is thereby fixed relative to the fixation device.

4,393,869

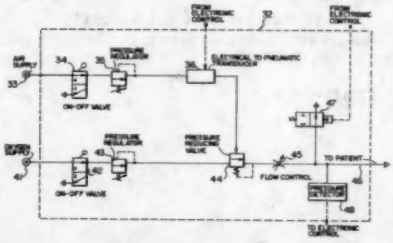
ELECTRONICALLY CONTROLLED RESPIRATOR

Abraham Boyarsky, Montreal; Jack Friedman, Cote St. Luc; Athanasios Christodoulopoulos, St. Laurent, and Rock Lee, St. Hubert, all of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Jun. 22, 1981, Ser. No. 276,151

Int. Cl.³ A61M 16/00

U.S. Cl. 128—204.18 **8 Claims**



1. A method of controlling the breathing cycle of a patient comprising:

determining the total resistance R of the patient's lungs;

determining the total compliance C of the patient's lungs;

determining the alveolar tidal volume $V^{\bullet}_{AT}$ of the patient's lungs;

delivering oxygen enriched air to the patient for an inspiration period τ of the breathing cycle at an initial pressure $RV^{\bullet}_{AT}/\tau$ and increasing the pressure to a pressure

$$\frac{R\,V_{AT}}{\tau} + \frac{V_{AT}}{C}$$

at the end of the inspiration cycle; and

lowering the pressure to a level below $RV^{*}_{AT/\tau}$ during an expiration period of the breathing cycle.

4,393,870

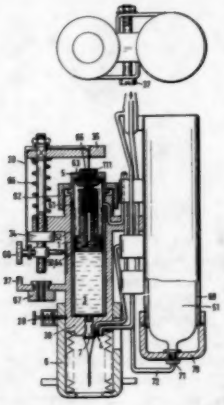
SUCTION INJECTOR

Wolfgang Wagner, Exercierstrasse 1, 1 Berlin 65, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 93,615, Nov. 9, 1979, Pat. No. 4,284,077, which is a division of Ser. No. 933,136, Aug. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 793,951, May 5, 1977, Pat. No. 4,114,691, which is a continuation-in-part of Ser. No. 634,741, Nov. 21, 1975, abandoned. This application Feb. 26, 1981, Ser. No. 241,378

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—115 **14 Claims**



1. A suction injector, particularly for use with hypodermic injections, comprising a container filled with a liquid medicine; a piston arranged for movement in said container; a cannula operatively connected to said container; a suction cup having an outer cylindrical portion defining an outer chamber and an inner cylindrical portion defining an inner chamber, said inner chamber having a surface to be positioned over human skin to be treated, said inner portion having an aperture for receiving said cannula through which the liquid medicine is discharged upon the movement of said piston and at negative pressure which is accumulated in said outer chamber during fabrication; and means for preventing communication of the negative pressure in said outer chamber to said inner chamber until said inner chamber is in pressure contact with the skin.

4,393,871

VAGINAL DEVICE

Bruce W. Vorhauer, Irvine, and Thomas A. Dobbie, Jr., Newport Beach, both of Calif., assignors to VLI Corporation, Costa Mesa, Calif.

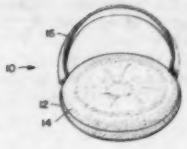
Continuation-in-part of Ser. No. 167,386, Jul. 9, 1980, abandoned, Ser. No. 96,295, Nov. 21, 1979, Ser. No. 96,293, Nov. 11, 1979, abandoned, Ser. No. 900,864, Apr. 28, 1978, which is a continuation-in-part of Ser. No. 810,109, Jun. 27, 1977, abandoned. This application Mar. 30, 1981, Ser. No. 249,228

Int. Cl.³ A61F *13/20*

U.S. Cl. 609—58 **24 Claims**

1. A vaginal device adapted for insertion and placement in the human vaginal cavity and subsequent removal therefrom, comprising:

a spermicide-foaming agent in a dry weight percentage of from about 10% to about 50%, and



a water-catalyzed foamed urethane polymer from which the spermicide is slowly released from the sponge during use.

4,393,872

ASPIRATING SURGICAL FORCEPS

Benjamin Reznik; Stanley Welber, and Ludwig Streifeneder, all of Chicago, Ill., assignors to Eder Instrument Co., Inc., Chicago, Ill.

Filed May 27, 1980, Ser. No. 153,181

Int. Cl.³ A61M *1/00*

U.S. Cl. 604—151 **11 Claims**

1. Surgical forceps capable of simultaneously aspirating liquids from a surgical site while grasping objects such as bone chips floating in said liquid, said forceps comprising:

(a) an elongate tubular body defining a channel which terminates at one end of said body to define a mouth;

(b) at least three springy prongs having inwardly bent distal ends;

(c) an actuating means disposed within the body for retracting said prongs substantially within the mouth of the channel and for extending said prongs outwardly from said mouth, said prongs diverging during outward extension and converging during retraction;

(d) a spring means cooperating with said actuating means for normally maintaining the prongs in a retracted position; and

(e) communication means within said body for allowing liquids to be aspirated from a surgical site through said mouth and channel while said prongs are extended, while said prongs are in said retracted position and while said prongs are intermediate said extended and retracted positions, whereby liquids are aspirated such that objects floating in the liquid are drawn towards the mouth facilitating the capture of such objects with said prongs.

4,393,873

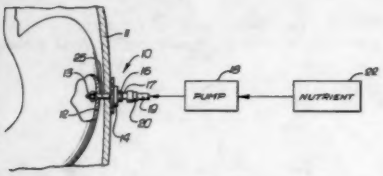
GASTROSTOMY AND OTHER PERCUTANEOUS TRANSPORT TUBES

Michael S. Nawash, 605 Nakoma St., Midland, Mich. 48640; Suzanne Stillman, 826 N. Whittier Dr., Beverly Hills, Calif. 90210, and Robert S. Mason, 745 W. Mariposa Ave., El Segundo, Calif. 90245

Division of Ser. No. 129,089, Mar. 10, 1980, Pat. No. 4,315,513. This application Jun. 29, 1981, Ser. No. 278,329

Int. Cl.³ A61M 25/00

U.S. Cl. 604—151 4 Claims



1. In a gastrostomy or like percutaneous transport tube of the type having a length of tubing with a first end configured for enlargement when inserted into the stomach or other bodily region of a patient, and apertured for the passage of fluids, an assembly at the other end of said tubing, comprising:

a rigid, generally cylindrical member having a certain shoulder portion, having at one end an axial projection engaging said tubing, and having at the other end a radially extending flange, there being an axial passageway through said member and communicating with said tubing, and

an annular skin protector disc formed of resilient material, said disc having a central aperture through which said shoulder portion extends, said disc thus seating between said flange and the external skin of the abdominal wall when said percutaneous transport tube is emplaced in a patient,

said skin protector disc having a set of raised ridges integral therewith on the side facing said skin, said ridges being arranged so as to permit the entry of air between said disc and the exterior abdominal wall.

4,393,874

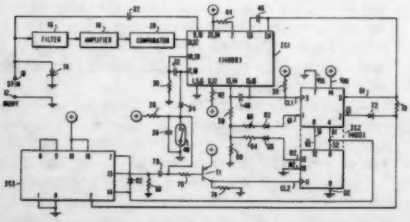
BRADYCARDIA EVENT COUNTING AND REPORTING PACER

Tibor A. Nappholz, Drummoyne, Australia; Barry Hinch, Princes Risborough, and David B. Shaw, Exeter, both of England, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Apr. 26, 1982, Ser. No. 372,026

Int. Cl.³ A61N 1/36

U.S. Cl. 128—419 PT 27 Claims



1. An implantable heart pacer comprising means for generating pacing pulses, means for sensing heart activity, means for controlling said generating means to generate pacing pulses at times dependent upon when heart activity was sensed, means responsive to said sensing means for counting heartbeat pauses which exceed a first predetermined interval and sequential heartbeat pauses of a predetermined number each of which exceeds a second shorter predetermined interval, and means for reporting on the state of said counting means.

4,393,875

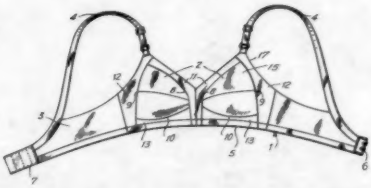
BRASSIERE

Dolores O'Boyle, Woodridge, and Phyllis Shonk, Glen Rock, both of N.J., assignors to International Playtex, Inc., Stamford, Conn.

Filed Dec. 22, 1980, Ser. No. 219,111

Int. Cl.³ A41C 3/00

U.S. Cl. 128—425 5 Claims



1. A series of brassieres of like styling for women whose size is selected from paired groupings of chest measurement ranges to diaphragm measurement ranges and whose bust measurement does not exceed her chest measurement by more than 2 inches and whose bust cup size designation is selected from subdivisions within said bust measurement ranges; each brassiere in said series including a pair of breast receiving components each having a depth adapted to enable the bust of the wearer within said selected size designation to closely fit therein, and a perimeter portion adapted to overlie the bust wall of the wearer in close juxtaposition to the bust of the wearer where the breast tissue extends outward of the chest wall, said perimeter portion having an inner edge section, an outer edge section and a base section and where each brassiere in said series further including a body encircling member adapted to extend about the wearer and the extent of said body encircling member measured from a point along the outer perimeter edge section of one of said breast receiving components to a like point along the outer perimeter edge of the other of said breasts receiving components is substantially the same for each brassiere in said series.

4,393,876

SHOE ORTHOSIS OR SHOE ORTHOSIS PARTS

Alfred Dieterich, Westtorgraben 3, Nürnberg, Fed. Rep. of Germany

Filed May 15, 1981, Ser. No. 264,110

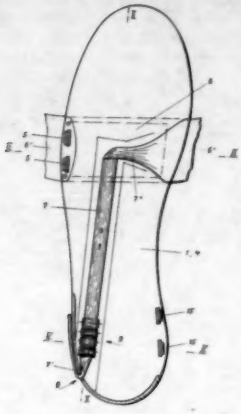
Claims priority, application Fed. Rep. of Germany, May 22, 1980, 3019561; Apr. 6, 1981, 3113820

Int. Cl.³ A43B 7/24

U.S. Cl. 128—583 19 Claims

1. A shoe orthosis device for corrective treatment of foot deformities wherein the pressure of the posterior part of the foot on the device is transmitted to the part of the foot which is to be treated in an intermittently acting force, comprising a sole member, means within said sole member which are adapted to be operated by said pressure to rotate the forefoot around the longitudinal axis of the foot and/or move it substan-

tially transversely to said longitudinal axis substantially about an axis perpendicular to the sole, whereby said means act on



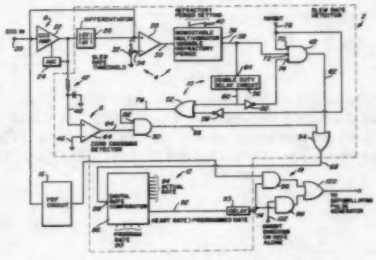
the inner side of the forefoot to lower it, thus rotating said forefoot.

4,393,877

HEART RATE DETECTOR

Mir Imran, Pittsburgh, and Steve Kolenik, Leechburg, both of Pa., assignors to Mieczyslaw Mirowski, Owings Mills, Md.

Filed May 15, 1981, Ser. No. 263,910
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—705 **37 Claims**



29. A system for use with an automatic defibrillator for defibrillating the heart of a patient experiencing abnormal cardiac rhythm, comprising:

input means for receiving ECG waveforms;

processing means coupled with said input means for processing the ECG waveforms in accordance with a probability density function to develop a probability density function output signal;

a heart rate detector coupled between said input means and a processing output means, said heart rate detector comprising,

first detecting means for detecting an ECG wave packet by detecting a first characteristic of said wave packet and providing a first output signal when said wave packet is detected;

second detecting means for detecting an ECG wave packet by detecting a second characteristic of said wave packet and providing a second output signal when said wave packet is detected;

rate detector output means for receiving the first and second output signals and for providing a rate detector output signal to the processing output means when the aggregate number of first and second output signals exceed a predetermined rate; and

coupling means for selectively coupling only one of said first and second detecting means with said rate detector output means whereby the aggregate number of first and second output signals represents the number of heart beats; and

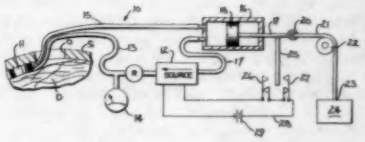
processing output means for coupling said processing means and heart rate detector with a defibrillating pulse generator for initiating the discharge of a defibrillating shock upon receiving a predetermined signal from at least one of said processing means and said heart rate detector.

4,393,878

PRESSURE MONITORING METHOD AND APPARATUS

Alan R. Kahn, Madison, Wis., assignor to Meadox Instruments, Inc., Oakland, N.J.

Continuation-in-part of Ser. No. 211,084, Nov. 28, 1980, abandoned. This application May 11, 1981, Ser. No. 262,381
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—748 **15 Claims**



1. Pressure monitoring apparatus comprising:

(a) a fluid pressure pump supplying gas under pressure;

(b) a pressure sensor including:

(1) a cup shaped housing having an open mouth and having an inlet and an outlet formed therein;

(2) a flexible diaphragm sealed over the open mouth of the housing to define a plenum between the walls of the mouth in the housing and the diaphragm, and wherein the inlet formed in the housing is in communication with the plenum;

(3) an exhaust tube centrally mounted in the housing within the plenum with an end thereof terminating adjacent the inner side of the diaphragm and connected to be in communication with the outlet from the housing;

(c) tubing connecting the pump to the inlet in the sensor housing to supply gas under pressure to the inlet and also connecting the outlet in the sensor housing to the pump to form a closed system;

(d) a flow restriction connected in the tubing between the pump and the inlet to the sensor housing so that the flow to the sensor is substantially uniform; and

(e) means for measuring pressure connected to measure the pressure in the tubing between the flow restriction and the inlet to the sensor housing, whereby changes in ambient pressure at the pressure sensor will result in movement of the diaphragm to alternately open and close the exhaust tube to automatically maintain the pressure within the plenum approximately equal to the ambient pressure, and whereby the means for measuring pressure in the tubing will measure a pressure which is approximately equal to the pressure within the plenum.

4,393,879

TISSUE-COLLECTING APPARATUS

Hyman T. Milgrom, Chicago, Ill., assignor to Milex Products, Inc., Chicago, Ill.

Filed Apr. 11, 1980, Ser. No. 139,240
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—758 **13 Claims**

1. In an apparatus for collecting animal or human tissue, said apparatus including a housing having an interior and an exterior, a curette having a tissue-scraping end and a passageway communicating with the housing interior and extending from said housing and terminating at a front end of the curette in a tissue-receiving opening, said housing acting as a handle for manipulating the apparatus, said housing having an outlet opening communicating with the interior of said housing and adapted to be connected to a source of vacuum for sucking tissue through said tissue-receiving opening of said curette and into said housing, the improvement wherein said housing is transparent along at least a portion of one longitudinally extending side thereof, and said housing having a substantially planar tissue collection screen inside said housing in the path of flow of said tissue to be drawn through said curette and into the housing, said screen extending longitudinally and obliquely of said housing for substantially the full length thereof, the screen having a multiplicity of tissue-screening apertures with inlet and outlet sides forming a communication between opposite laterally facing sides of the screen, said apertures being of such a size to catch the tissue being drawn through the housing and screen, the inlet side of the apertures on the side of said screen facing said longitudinally transparent portion of said one side of said housing, and the length of said housing being substantially greater than the lateral dimension thereof so that the obliquely extending screen which extends for substantially the full length of the housing has such a substantial longitudinal component that any tissue collected thereon is readily visible to the user looking laterally into the housing as he grasps the housing to manipulate the apparatus.

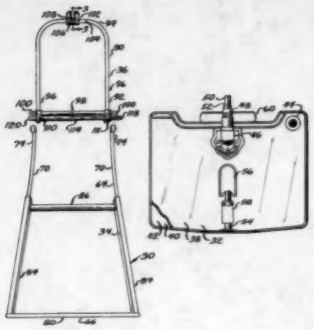
4,393,880

DEVICE FOR COLLECTING BODY LIQUIDS

Glenn N. Taylor, Cary, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Mar. 25, 1981, Ser. No. 247,499
Int. Cl.³ A61F *5/44*
U.S. Cl. 128—760 **18 Claims**

1. A device for collecting body liquids, comprising:
a receptacle having a chamber to receive and collect body liquids;
a stand having a back member having upper and lower portions, and leg means extending from the lower portion of said back member to support the back member in an upright position; and
means for connecting an upper portion of the back member to an upper portion of the receptacle to support the receptacle in a upright position by the stand, wherein the connecting means releasably attaches the back member to the receptacle, with the connecting means comprising a tunnel in an upper portion of the receptacle, a rod extending through the tunnel, and means for attaching said rod to the back member, wherein the attaching means comprises a pair of spaced apertures in the upper portion of the back member, a pair of spaced bosses removably received in said apertures, a pair of spaced ears connected to said bosses, said ears having openings to removably receive said rod with the tunnel located intermediate said ears.

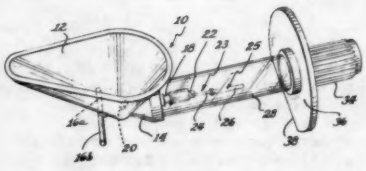


4,393,881

MIDSTREAM URINE COLLECTION DEVICE

Nayan S. Shah, 15091 Isleview, Chesterfield, Mo. 63017

Continuation-in-part of Ser. No. 78,570, Sep. 24, 1979, abandoned. This application Jun. 3, 1981, Ser. No. 270,005
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—760 **16 Claims**



1. A midstream urine collection device (10) comprising:
a receiving cup (12) having a fluid receiving cavity with an opening therein;
support means (16*a*, 16*b*) carried by said cup (12) and engageable with a support surface to retain said cup (12) with the opening facing upwardly away from said support surface;
a needle assembly (23) carried by a lower portion of said cup (12) and extending outwardly away from the fluid receiving cavity in said cup, a channel (20) communicating between said cup (12) and said needle assembly (23); and
valve means (25) on said needle assembly (23) controlling the flow of fluid through said needle assembly (23).

4,393,882

METHOD AND DEVICE FOR COLLECTING, TRANSPORTING, AND DELIVERING MICRO SAMPLES OF BLOOD

Fred K. White, Miami, Fla., assignor to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 71,702, Aug. 31, 1979, Pat. No. 4,263,922.
This application Nov. 17, 1980, Ser. No. 207,372
Int. Cl.³ A61B *5/14*
U.S. Cl. 128—764 **11 Claims**

1. A one-piece adapter for use in collecting micro samples of blood for laboratory testing, said adapter having integral body and tip sections formed entirely of resilient plastic material, said adapter having a bore extending through said body and tip sections, said tip section having a frusto-conical outer surface dimensioned and tapered outwardly towards the free end of said tip section to provide a male Luer taper and having the portion of said bore extending therethrough tapering gradually inwardly at an angle within the range of about 1° to 3° measured from the longitudinal axis of said adapter for receiving and engaging the inlet tube of a blood analyzer, said body section of said adapter having the portion of said bore extending therethrough tapering gradually inwardly at an angle within the range of about 2° to 6° measured from the longitudinal axis of said adapter and encompassing diameters of about 0.08 to 0.10 inches.

4,393,883

SINGLE PASS A-V LEAD

Nicholas P. D. Smyth, Bethesda, Md.; Jeanne M. Lesniak, Columbia Heights, and Kenneth B. Stokes, Brooklyn Park, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 3, 1980, Ser. No. 203,298
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—785 **6 Claims**

1. A single pass dual chamber pacing lead comprising:

a connector;

an outer sheath having a proximal end attached to said connector and having a distal end and having a junction point intermediate said proximal end and said distal end, said outer sheath having a "J" shaped bend located intermediate said distal end and said junction point;

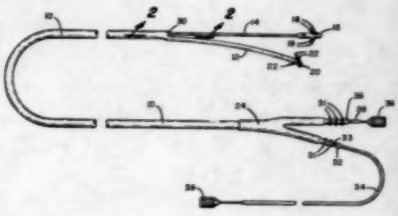
a first space wound coil conductor located within said outer sheath having a proximal end coupled to said connector and having a distal end;

an atrial electrode coupled to said distal end of said first space wound coil conductor;

a first stylet removeably insertable in said first space wound coil conductor which when inserted substantially straightens said outer sheath and whereby placement of said atrial electrode is controlled;

a ventricular electrode;

a second space wound coil conductor slideably located within said outer sheath between said proximal end and said junction point of said outer sheath having a distal end attached to said ventricular electrode, said first and second space wound coil conductors mutually insulated, said second space wound coil conductor slideable in a proximal direction within said outer sheath whereby said second space wound coil conductor may be substantially withdrawn into said outer sheath;



a second stylet insertable in said second space wound coil conductor whereby placement of said ventricular electrode is controlled; and

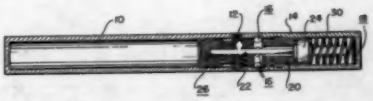
a space wound coil located within said outer sheath and having a proximal end attached to said connector and a distal end attached to said atrial electrode located coaxially about said first conductor between said junction point and said atrial electrode and located coaxially about said second conductor between said junction point and said connector.

4,393,884

DEMAND INHALER FOR ORAL ADMINISTRATION OF TOBACCO, TOBACCO-LIKE, OR OTHER SUBSTANCES

Allen W. Jacobs, 12538 Oxnard St., #3, North Hollywood, Calif. 91606

Filed Sep. 25, 1981, Ser. No. 305,466
Int. Cl.³ A24D *1/00*; A61M *15/00*
U.S. Cl. 131—273 **6 Claims**



1. A dispenser for introducing a substance into the mouth of a user comprising: means defining a reservoir for containing the substance in a pressurized state and also defining an inner chamber in axial alignment with the reservoir and having an apertured end portion at the end thereof opposite to said reservoir; a partition interposed between said reservoir and said inner chamber and having an aperture therein; an elongated member mounted for reciprocal pivotal movement in said inner chamber and having a first angular position in said inner chamber in which the aperture in the partition is closed, and said elongated member having a second angular position within said inner chamber in which the aperture is open for releasing the substance from the reservoir to the apertured end portion of said inner chamber; and in which the user selectively introduces suction to the inner chamber through the apertured end portion thereof to move the elongated member from its first angular position to its second angular position so as to cause the aperture in said partition to open to enable the substance in the reservoir to be introduced into the mouth of

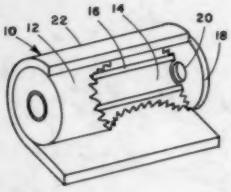
the user through said apertured end portion under the control of the user.

4,393,885

CIGARETTE FILTER

Donald A. Silberstein, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Sep. 21, 1981, Ser. No. 303,756
Int. Cl.³ A24D 3/04
U.S. Cl. 131—339 8 Claims



1. A filter for a cigarette, comprising:

a first longitudinally extending cylindrical chamber;

a second longitudinally extending cylindrical chamber disposed within the first chamber with a spacing between the outer wall of the second chamber and the inner wall of the first chamber, the wall of the second chamber being air impervious;

transversely disposed smoke impervious partition means disposed at the end of the chambers interfacing with a tobacco column of the cigarette; and,

means defining at least one orifice through said smoke impervious partition means for providing direct flow communication between the tobacco column of the cigarette and the interior of said second chamber whereby no smoke comes in contact with the exterior of said second chamber, the at least one orifice having a smaller cross-sectional area than the cross-sectional area of the second chamber, said first and second chambers being of substantially the same length with their ends being transversely aligned.

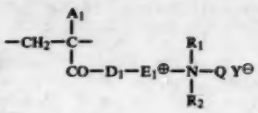
4,393,886

MIXTURES OF QUATERNARY, POLYMERIC, HIGH MOLECULAR WEIGHT AMMONIUM SALTS, WHICH ARE BASED ON ACRYLIC COMPOUNDS, AND SURFACTANTS, THEIR PREPARATION, AND THEIR USE IN COSMETICS

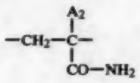
Dieter Strasilla, Weil am Rhein, Fed. Rep. of Germany; Laszlo Moldovanyi, Basel, Switzerland; Charles Fearnley, and Hubert Meindl, both of Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 27, 1981, Ser. No. 286,811
Claims priority, application Switzerland, Sep. 5, 1980, 6688/80
Int. Cl.³ A45D 7/00
U.S. Cl. 132—7 17 Claims

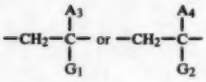
1. A cosmetic composition which contains water, (a) at least one ammonium salt which is soluble or gives a microemulsion in aqueous surfactant systems and which has a molecular weight distribution of 10^4 to 10^9, the molecular weight of at least 5 percent by weight of the copolymeric salt being 10^7 to 10^9 and the salt containing on average 5 to 100 mole % of recurring structural elements of the formula



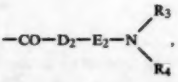
and O to an average 95 mole % of recurring structural elements of the formula



and O to an average 10 mole % of recurring structural elements of the formulas



in which A_1, A_2, A_3 and A_4 are each hydrogen or methyl, G_1 and G_2 differ from one another and are each —CN, —COOH or



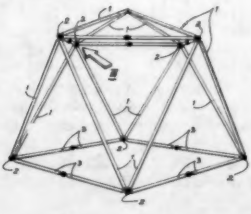
D_1 and D_2 are each oxygen or —NH—, E_1 and E_2 are each alkylene having 1 to 4 carbon atoms which is unsubstituted or substituted by hydroxyl, R_1, R_2, R_3 and R_4 are each methyl or ethyl, Q is alkyl, hydroxyalkyl having 1 to 4 carbon atoms or benzyl, and Y^- is a halide, alkylsulfate or alkylphosphonate anion having 1 to 4 carbon atoms in the alkyl radical, and (b) at least one non-ionic surfactant or a surfactant with one positive and one negative charge within the molecule, wherein the composition contains components (a) and (b) in a weight ratio of 1:2 to 400.

4,393,887

COLLAPSIBLE TENT FRAME

Edwin H. Oribin, K. & K. Factory, Mayne St., Launceston, Tasmania, 7250, Australia

Continuation of Ser. No. 66,863, Aug. 15, 1979, abandoned. This application Jun. 15, 1981, Ser. No. 273,967
Claims priority, application Australia, Aug. 17, 1978, PD5520
Int. Cl.³ A45F 1/16
U.S. Cl. 135—109 13 Claims



1. A rigid self supporting collapsible tent frame comprised of triangular roof and wall frame sections formed of elongate frame members hingedly interconnected at their ends to form

a unitary structure in both the erected and collapsed state, the adjacent triangular roof frame sections of said collapsible tent having a common elongate roof frame member and alternate ones of the triangular wall frame sections having an elongate member common with a triangular roof frame section, said roof frame sections having a common apex in both the erected and collapsed state, the elongate members common to the wall and roof frame sections being hingedly connected at the ends thereof to define the ceiling area of the tent, said common wall and roof frame section members being comprised of at least two parts connected by means to provide a flexible joint that is spring loaded and allows both expansion and contraction at a point therealong remote from the points of connection of other roof frame section members connected thereto, the remaining alternate ones of the triangular wall frame sections having two common elongate frame members with the first mentioned alternate triangular wall frame sections and being inversely arranged relative thereto to define the base area and a plurality of free corners of the tent, the elongate frame members of the remaining alternate triangular wall frame sections defining the base area and the plurality of free corners of the tent being comprised by means to provide a flexible joint at an intermediate point therealong remote from the points of connection of the first mentioned alternate triangular wall frame sections thereto.

4,393,888

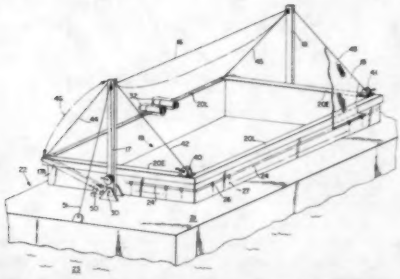
METHOD OF PROTECTING CONTENTS OF A BARGE WHILE IN TRANSIT

James E. Nivin, Louisville, Ky., assignor to American Commercial Barge Line Co., Jeffersonville, Ind.

Division of Ser. No. 831,648, Sep. 8, 1977, Pat. No. 4,130,125. This application Aug. 10, 1978, Ser. No. 932,667

Int. Cl.³ B63B *19/14*

U.S. Cl. 114—201 R **4 Claims**



1. The method of protecting contents of a barge in transit with an open hatch from the weather comprising the steps of erecting a light-weight fabric pup-tent like hatch cover array to extend above the hatch over a ridge pole assembly affixed to the deck and maintaining the tent in erected position over the ridge pole assembly in transit in the place of alternative hatch cover means, erecting from a folded position stowed on deck the ridge pole assembly affixed to the deck of the barge to extend over the top of the open hatch, placing a removable tent fabric sheet over the framework, fastening the sheet edges to the barge, and removal of the tent fabric and storing for further use on the barge deck by folding the fabric and then rolling the fabric from two ends onto a pair of bobbins.

4,393,889

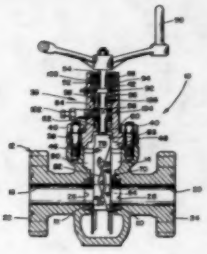
FIRE-SAFE VALVE STRUCTURE

Scott W. Binegar, and Hamid J. Saka, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Mar. 17, 1981, Ser. No. 244,532

Int. Cl.³ F16K *13/04*

U.S. Cl. 137—72 **4 Claims**



1. In an expanding gate valve having a valve body with a flow passage therethrough, a valve chamber in the body communicating with the flow passage, and an expanding gate assembly movably mounted in the valve chamber for opening and closing the flow passage, and wherein the valve chamber becomes sealed off from the flow passage in the open and closed conditions of the valve, means defining an annular recess in said valve body circumferentially surrounding the flow passage on the upstream side of said valve element and opening between said valve chamber and said flow passage, said recess having a rear wall extending from the flow passage generally radially thereof and a circumferential cylindrical wall extending substantially coaxially to the flow passage from the valve chamber to said rear wall, and sealing means adapted to sealingly engage the gate assembly in its opened and closed conditions whereby said valve chamber becomes sealed off from said flow passage; an improved valve structure comprising:

an annular metallic seat disposed in said annular recess, said annular seat having an inner annular cylindrical surface substantially coaxial to and facing said flow passage and an outer peripheral annular cylindrical surface substantially coaxial to said inner annular cylindrical surface and facing said recess circumferential wall, said annular seat having a port therein extending in a generally radial manner from the flow passage between said inner annular cylindrical surface and said outer peripheral annular cylindrical surface such that the outer end of the port is exposed to the interior of the valve chamber and the inner end of the port is exposed to said flow passage; and

a relief plug of a selected temperature degradable material positioned in a plugging relationship within said port, said relief plug being exposed to both the fluid environment within said valve chamber on its outer end and said flow passage on its inner end whereby the valve chamber is sealed off from the flow passage during the open and closed conditions of the gate valve and said relief plug is caused to evacuate the port into the upstream flow passage upon the fluid environment in the valve chamber reaching a preselected temperature condition or when a preselected pressure differential exists between the valve chamber and flow passage.

4,393,890

METHOD AND DEVICE FOR AUTOMATIC IRRIGATION

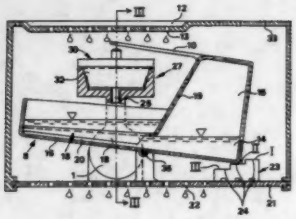
Einar Skappel, Kvartaervaegen 12, SE 595 00 Mjoelby, Sweden

PCT No. PCT/SE79/00213, § 371 Date Jun. 23, 1980, § 102(e) Date Feb. 22, 1980, PCT Pub. No. WO80/00777, PCT Pub. Date May 1, 1980

PCT Filed Oct. 22, 1979, Ser. No. 224,225

Int. Cl.³ F16K *17/36*

U.S. Cl. 137—78.2 9 Claims



1. A control apparatus for an irrigation system, comprising a container adapted to receive a quantity of a fluid, valve means having an inlet and an outlet and responsive to variations in the quantity of fluid in said container for respectively effecting and obstructing communication between said inlet and said outlet when the quantity of said fluid in said container is less than and greater than a predetermined amount, and temperature responsive means for varying the quantity of said fluid in said container in response to changes in the temperature of the ambient air, the quantity of fluid in said container being progressively decreased and increased as the ambient air temperature respectively decreases and increases, said temperature responsive means including a closed chamber partially filled with said fluid and partially filled with a gas, said gas having a volume which respectively increases and decreases as the temperature of said gas increases and decreases, and means for effecting fluid communication between a lower portion of said container and a lower portion of said chamber, a change in ambient air temperature effecting a change in the volume of said gas in said chamber, causing fluid to be drawn into or forced from said chamber through said means for effecting communication, the quantity of fluid in said container respectively increasing and decreasing as the quantity of fluid in said chamber decreases and increases.

4,393,891

DEVICE FOR TEMPORARILY RINSING A WATER COCK COUNTERSUNK IN THE GROUND

Govert J. Snoek, and William J. Tuil, both of Dieren, Netherlands, assignors to Ocean B.V., Dieren, Netherlands

Filed Sep. 22, 1981, Ser. No. 304,678

Claims priority, application Netherlands, Sep. 23, 1980, 8005300

Int. Cl.³ B08B *9/02*; F16K *31/122*

U.S. Cl. 137—238 8 Claims

1. A drain valve for use with a water cock countersunk into the ground surface and including an extension pipe piece with a closing member being disposed above the ground surface, said water cock being in fluid communication with said extension pipe piece and said closing member comprising:

a drain pipe device operatively connected between the water cock and the closing member positioned in the extension pipe piece;

a valve body slidable disposed adjacent to said drain pipe device to selectively permit the fluid communication between said extension pipe piece and said drain pipe device;

biasing means for normally biasing said valve body into an open position for normally permitting the fluid communication between said extension pipe piece and said drain pipe device during initial opening of said water cock for permitting rinsing of impurities from the water cock prior to the opening of said closure member; and

delay closing means actuated by fluid pressure within said extension pipe piece for closing said valve body to prevent communication between said extension pipe piece and said drain pipe device after the expiration of a predetermined time period.

4,393,892

ROTARY VALVE FOR CONTROLLING THE FLOW OF A SOLID PARTICULATE MATERIAL

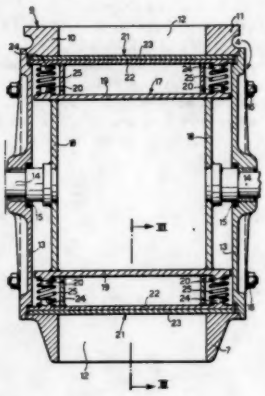
Gaetano Di Rosa, Pino Torinese, Italy, assignor to F.A.T.A. - Fabrica Apparecchi di Sollevamento e Trasporto ed Affini S.p.A., Turin, Italy

Filed Mar. 21, 1978, Ser. No. 888,791

Claims priority, application Italy, Jun. 3, 1977, 68286 A/77

Int. Cl.³ F16K *3/36*

U.S. Cl. 137—242 3 Claims



1. A rotary valve for controlling the flow of a solid particulate material comprising a hollow body having an internal circumferential surface provided with two diametrically opposed valve ports, a rotatable support disposed within said body, two diametrically opposed obturator elements carried by said rotatable support and cooperating with said valve ports, each obturator being movable radially relative to said support and relative to the other obturator element, and resilient means disposed between said support and each obturator element for urging each obturator element radially outwardly relative to said support and against said internal circumferential surface of the valve body, said body having internal end surfaces perpendicular to said circumferential surface, said support being in the form of said rectalinear frame having two sidewalls adjacent the internal end surfaces of said body, at least one of said sidewalls being fixed to a drive shaft, said

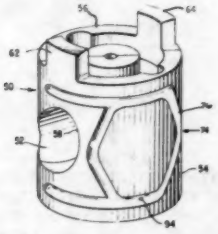
frame having two additional sidewalls adjacent the internal circumferential surface of the body so that solid material will pass through the rectalinear frame when the valve is open, each obturator element having a bearing surface cooperating with a bearing surface on the support for the purpose of moving said obturator element circumferentially upon closure of the associated valve port with said bearing surfaces being inclined to each other in such a way that upon closure of the valve the support applies to each obturator element a direct radially outward force in order to augment the radial force of the resilient means.

4,393,893

LUBRICATED SPLIT PLUG VALVE

William H. Alexander, Houston, Tex., assignor to Vapor Corporation, Chicago, Ill.

Filed Dec. 12, 1980, Ser. No. 215,728
Int. Cl.³ F16K 5/22
U.S. Cl. 137—246.12 **8 Claims**



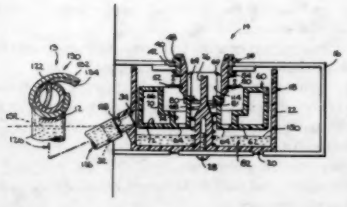
1. A valve element for a valve comprising:
a valve body including a cylindrical bore therethrough with first and second ports thereto;
said valve body split along a plane oblique to said bore to define first and second core members; and
first and second identical continuous grooves defined in the outer peripheral surfaces of said first and second core members, respectively;
said first and second grooves each comprising; a first portion circumferentially displaced from said port and a second portion essentially surrounding said port.

4,393,894

FLUID SUPPLY AND DISPENSING APPARATUS

Hans C. Mol, Wilton, and LeRoy H. Byrne, Waterbury, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 23, 1981, Ser. No. 324,330
Int. Cl.³ G05D 9/00
U.S. Cl. 137—454 **8 Claims**



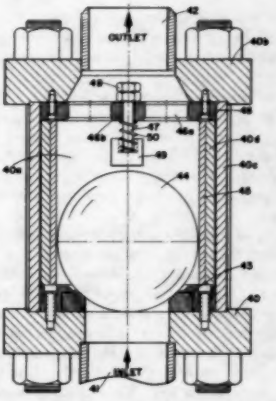
1. In a fluid supply and dispensing system including fluid dispensing means for carrying a working supply of fluid having a working surface level, and including reservoir means connected in fluid flow communication with said dispensing means for carrying a replenishing supply of fluid having a surface level which establishes the working surface level of the working supply of fluid, an improvement for lowering the working surface level to a non-working level, said improvement comprising:
a. said reservoir means including a movable fluid displacement member which is normally lowered into the replenishing supply of fluid; and
b. means for raising the displacement member at least partially out of the replenishing supply of fluid, whereby the surface level of the replenishing supply of fluid and thus the working supply surface level is lowered to a non-working level.

4,393,895

CHECK VALVE FOR USE WITH HIGH PRESSURE PUMP

Robert J. Rubey, Wisconsin Rapids, Wis., assignor to Sterling Drug Inc., New York, N.Y.

Filed May 14, 1981, Ser. No. 263,506
Int. Cl.³ F16K 15/04
U.S. Cl. 137—539.5 **2 Claims**



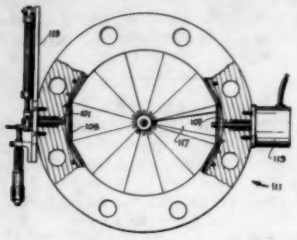
1. A check valve member for use with a high pressure pump, said valve comprising:
a valve body having an inlet and an outlet and a fluid passageway therebetween;
a valve seat in said passageway between said inlet and said outlet;
a valve member comprising a ball in said passageway movable toward said valve inlet for seating against said valve seat for sealing said passageway against backflow of fluid therethrough;
a plate extending across the outlet end of said valve body and having one or more apertures therein for passage of fluid therethrough;
a plunger slidably mounted on said plate for movement toward and away from said valve seat coaxially with the axis of said valve body and in the position closest to said valve seat projecting to within 1 to 10 mm of the valve member when said valve member is seated on said valve seat and in the position furthest from said valve seat acting as a valve member lift limiter;
spring means urging said plunger toward and into contact with said valve member and permitting movement of said plunger away from said valve seat sufficiently far to permit said valve member to attain a maximum lift position; and
adjusting means mounted on said plunger and operably associated with said plate for adjusting the position of said plunger toward and away from said valve seat.

4,393,896

RADIAL VANE GAS THROTTLING VALVE FOR VACUUM SYSTEMS

Edward J. Slabaugh, San Jose, Calif., assignor to Comptech, Incorporated, San Jose, Calif.

Filed Aug. 27, 1982, Ser. No. 412,251
Int. Cl.³ F16K 13/00
U.S. Cl. 137—601 15 Claims



1. A gas flow control valve comprising:

an annular flange having a continuous inner peripheral surface and a spaced apart, outer peripheral surface connected to the inner peripheral surface in a gas barrier relation between opposed side walls,

a plurality of movable vanes disposable in a common plane closing the inside of the annular flange, said common plane parallel to the flange side walls, said vanes radially mounted for rotational shutter-like movement out of said common plane by inclining on an axis out of said common plane,

a plurality of rotatable shims having an outer toric surface, matching the curvature of the inner peripheral surface of the flange and having a rotational support means for connection to the inner peripheral surface of the flange, each shim having a support side connected to a vane for transmitting shim rotation to a connected vane and further having rim means for transmitting rotational motion to rim means of adjacent shims, and the shims arranged in an endless rim-to-rim motive communication relation,

coupling means supported in the flange from the outside peripheral region to the inside peripheral region for communicating rotary motion from outside the flange to one of the shims.

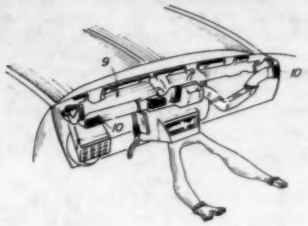
4,393,897

FLUID OUTLET STRUCTURE

Masao Izumi, Fujisawa; Hiroshi Yoshida, Zama, and Yukio Yoshikawa, Hiratsuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Tokyo Sokuhan Co., Ltd., Zama, both of, Japan

Filed Nov. 19, 1980, Ser. No. 208,386
Claims priority, application Japan, Nov. 20, 1979, 54-149452
Int. Cl.³ F15C 1/04
U.S. Cl. 137—831 3 Claims

1. A fluid outlet structure using a fluid element including a supply opening for supplying compressed fluid, an outlet opening corresponding to said supply opening for fluid exhaust, a main fluid passage formed between said openings and control fluid passages comprising cavities provided in sidewalls on inner opposite sides of said main fluid passage, two supplementary fluid control members, each having two supplementary cavities divided by a center wall forming a T-shaped body in each said supplementary fluid control member, each said supplementary cavity having a supplementary control fluid passage communicating with said main fluid passage, and two communicating pipes, each communicating with said cavity in one of said sidewalls and one of said supplementary cavities of said supplementary fluid control members remote from said sidewalls, so that each said supplementary control fluid passage causes control fluid from said control fluid passage of one of said sidewalls to flow against the other sidewall.

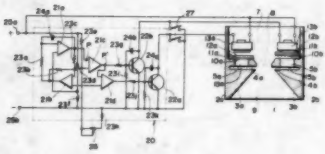


4,393,898

FLUID OUTLET DEVICE AND A METHOD OF CONTROLLING FLUID FLOW THROUGH A NOZZLE

Masao Izumi, Fujisawa; Hiroshi Yoshida, Zama, and Yukio Yoshikawa, Hiratsuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 24, 1980, Ser. No. 219,637
Claims priority, application Japan, Dec. 28, 1979, 54-171762
Int. Cl.³ B05B 1/14
U.S. Cl. 137—831 5 Claims



1. A fluid outlet device for directing a fluid comprising:

(a) a nozzle including the following portion;

(1) an inlet port;

(2) an outlet port;

(3) a throat portion formed between said inlet port and outlet ports;

(4) first and second fluid control chambers positioned on either side of said throat;

(5) first and second control fluid passages communicating with respective fluid control chambers;

(6) first and second flappers for regulating the flow of fluid through respective control fluid passages; and

(7) first and second electromagnets for controlling the operation of respective flappers, and

(b) a control circuit comprising:

(1) first and second switching means for actuating respective electromagnets;

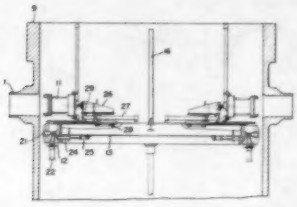
(2) a control signal generator for supplying timed alternating square wave pulses to respective switching means; and

(3) first and second delay means respectively connected to said first and second switching means for retarding respective turn off timings thereof.

4,393,899
PLUGGING APPARATUS

Tadashi Tsuji, and Ryokichi Igarashi, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Dec. 1, 1980, Ser. No. 211,845
Claims priority, application Japan, Dec. 21, 1979, 54-166357
Int. Cl.³ G21C *17/00, 19/20;* F16L *55/10*
U.S. Cl. 138—89 6 Claims

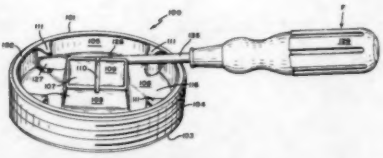


1. Apparatus for plugging a plurality of cylindrical holes provided through an inner peripheral wall of a cylindrical container, said apparatus comprising a plurality of plugs to be inserted into said plurality of holes for plugging the same, a supporting ring assembly having an outer diameter smaller than an inner diameter of said container, a beam assembly detachably connected to said ring assembly, means provided on said beam assembly for supporting said plurality of plugs and simultaneously forcing said plugs radially outwardly into said cylindrical holes of said cylindrical container, and means for preventing said plugs from being driven radially inwardly out of said cylindrical holes.

4,393,900
INSERT PLUG

Padej Gajajiva, Fairfield, and Eigil Wium, Cheshire, both of Conn., assignors to General Signal Corporation, Stamford, Conn.

Filed Nov. 25, 1981, Ser. No. 325,075
Int. Cl.³ F16L *55/24*
U.S. Cl. 138—89 14 Claims



1. A plug for use with a mating body member and comprising in combination:

(a) a generally cylindrical plug member threaded on its outer cylindrical surface;

(b) a closing surface member for closing said plug member at the lower limit thereof;

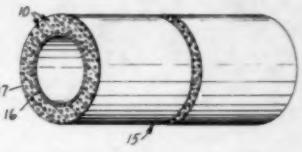
(c) said closing surface member including a central upward projecting member; and wherein

(d) said cylindrical plug member includes an inner surface having a first longitudinal surface projecting inward and disposed on said inner surface in a manner to permit a linear lever to be positioned for an end thereof to contact said first longitudinal surface concurrently with an intermediate portion of said lever contacting said upward projecting member whereby a turning torque may be exerted on said plug in response to the application of force on the linear lever.

4,393,901
LOW-PERMEABILITY HOLLOW SPHERES AND PIPE FILLED WITH THE SPHERES FOR TEMPORARY WEIGHT REDUCTION

Warren R. Beck, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 190,718, Sep. 24, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,455
Int. Cl.³ C04B *31/04;* F16L *1/04, 9/08*
U.S. Cl. 138—145 7 Claims



1. Reduced-density pipe which absorbs water at a rate that remains substantially unchanged even after storage under moist or wet conditions and which improves the laying of underwater pipeline at great depths by minimizing forces that tend to buckle a pipeline and by permitting retrieval of recently laid pipeline, said pipe comprising a porous cement-based cylindrical shell surrounding a core pipe and filled with hollow spheres that (a) average between 0.05 and 2 centimeters in diameter, (b) have a density of no more than about 0.35 gram per cubic centimeter, and (c) individually comprise (i) a porous hollow core sphere comprising a polymeric binder material and a plurality of solid particles held by the binder material, at least a portion of the thickness of the sphere wall being filled by the particles and the particle-filled sphere wall being permeable such that said core spheres fill instantly with air at a pressure of about 2 pounds per square inch; and (ii) a coating on the exterior surface of the porous hollow core sphere that partially seals the core sphere; said coated spheres exhibiting a stable slow permeability to water such that between about one and ten weeks is required for the spheres to fill with water under an ocean-depth pressure of 10 or more kilograms per square centimeter, whereby the cement shell gradually increases in density when immersed in a body of water at depths that apply such a pressure.

4,393,902
TRANSMISSION FOR THE SHED-FORMING MECHANISM OF A LOOM

Josef Brock, Viersen, Fed. Rep. of Germany, assignor to Maschinenfabrik Carl Zangs Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Filed Sep. 11, 1980, Ser. No. 186,032
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1979, 2937760
Int. Cl.³ D03C *1/00;* F16H *1/28, 35/02*
U.S. Cl. 139—76 10 Claims

1. In a transmission for a shedding mechanism (dobby) of a loom for the production of a nonuniform drive from a uniform drive comprising a drive shaft and a driven shaft aligned therewith, said shafts being supported in a transmission housing, the improvement comprising

a rotor arranged fixed for rotation on said drive shaft,

at least one gear segment,

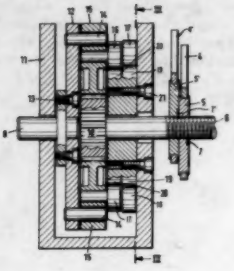
an eccentric shaft swingably supports said gear segment on said rotor,

each of said at least one gear segment has two cam rollers arranged in different planes,

a driven pinion arranged fixed for rotation on said driven shaft engages said gear segment,

two cams fastened in said different planes respectively to the transmission housing,

said cam rollers cooperate with said cams in form-locked manner,



said cams are asymmetrically formed such that an adjustable relative movement per revolution between the drive shaft and the driven shaft is produced dependent on the form of said two cams.

4,393,903

WEFT FEELER UNIT FOR A FLUID-JET LOOM

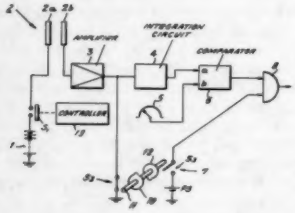
Yoshio Ida, Kanazawa, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Japan

Filed Apr. 29, 1981, Ser. No. 258,455

Claims priority, application Japan, Jun. 23, 1980, 55-85656

Int. Cl.³ D03D *51/34*

U.S. Cl. 139—370.2 **10 Claims**



1. Improved weft feeler unit for a fluid-jet loom, comprising:

a weft feeler made up of first and second electrodes which are mounted to the reed of said loom on the weft arrival side, and which are spaced from each other along the traveling path of a weft; and

means for applying a voltage of 900 to 3,000 volts to said electrodes, which voltage is sufficiently high to establish a virtual electric connection between said electrodes and said weft even when there is a physical gap between said weft and either of said electrodes due to whipping of said weft as long as said weft has been normally inserted.

4,393,904

METHOD AND DEVICE FOR WINDING STATORS OR THE LIKE

Willi Muskulus, Frankfurt, Fed. Rep. of Germany, assignor to Balzer & Droll KG, Niederdorfelden, Fed. Rep. of Germany

Division of Ser. No. 14,546, Feb. 23, 1979, Pat. No. 4,221,243.

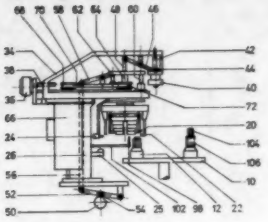
This application Jun. 24, 1980, Ser. No. 162,432

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2808048

Int. Cl.³ H02K *15/04*

U.S. Cl. 140—92.1 **3 Claims**

2. In a method of stripping electrical windings from a winding form onto which said windings are wound onto a collecting tool, said collecting tool comprising an inner ring of collecting lamellae and a concentrically disposed outer ring of cover strip lamellae, said collecting lamellae being retractable and extensible relative to said cover strip lamellae, said stripping being effected by stripping said windings from said form onto said collecting tool, the improvement wherein, during



said stripping, said collecting lamellae are retracted to a position wherein their free ends are positioned immediately beyond the free ends of the cover strip lamellae such that they extend therebeyond a distance less than the thickness of a stator packet which is to receive a winding.

4,393,905

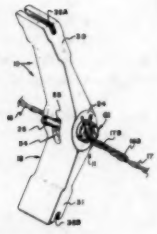
WIRE SPLICING TOOL

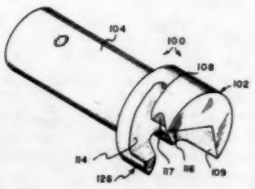
Frank A. Perrien, 205 Calva Rd., North Little Rock, Ark. 72116

Filed Sep. 14, 1981, Ser. No. 301,471

Int. Cl.³ B21F *15/04*

U.S. Cl. 140—118 **7 Claims**





1. A wire splicing tool comprising:

elongated, rigid frame means adapted to be manually grasped by a user of said tool; the frame means having a generally tubular center portion and a pair of integral, spaced-apart ends extending outwardly from said center portion;

rotatable wire control means associated with said frame center portion for controlling wires to be spliced, said rotatable wire control means comprising:

shank means rotatably received within said frame center

for selectively capturing at least a portion of first wire end; and,

head means for forcibly contacting and splicing a second wire end about said first wire end in response to rotation of said tool by said user;

manually operated means for rotating said wire control means between a first wire admitting or discharge position and a second wire capturing position, said last mentioned means for manually rotating said wire control means comprising an elongated stem projecting outwardly from said control means shank generally perpendicularly outwardly from said frame within a travel limiting slot which prevents rotation of said wire control means when said tool is rotated to splice wire ends;

said tubular frame center comprising a slot for admitting or discharging a wire segment; and,

said shank means comprising an elongated wire receptive groove adapted to be selectively registered in alignment with said slot for admitting or discharging a wire end, and operable when not aligned with said slot to capture a wire segment passing therethrough.

4,393,906

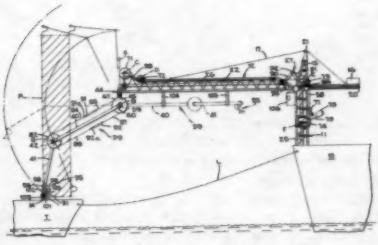
STERN TO BOW OFFSHORE LOADING SYSTEM

William A. Gill, El Toro, Calif., assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 80,369, Oct. 1, 1979, abandoned. This application Mar. 23, 1981, Ser. No. 246,565

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—387 **8 Claims**



1. A loading system for transferring fluid from one fluid handling means to another and to provide for relative movement between the different handling means, said system comprising:

a support structure for mounting on a first fluid handling means;

a horizontal support boom having an inboard end connected to said support structure;

a boom conduit member mounted along said boom;

means for coupling the inboard end of said boom conduit member to said first handling means;

an articulated loading arm having one end thereof pivotally connected to the outer end of said boom conduit member for movement about a first horizontal axis;

an inboard sheave;

means for mounting said inboard sheave for rotation about said first horizontal axis with said inboard sheave fixed to said loading arm;

a tower sheave rotatably mounted on said support structure;

a loading arm support cable;

means for connecting said support cable between said inboard sheave and said tower sheave including a plurality of idler sheaves, means for pivotally mounting a first idler sheave on the outer end of said support boom adjacent said inboard sheave, means for mounting a second idler adjacent said tower sheave, means for connecting a first end of said support cable to said inboard sheave, said support cable being trained around said inboard sheave and trained around a portion of said first and said second idler sheaves, and means for connecting a second end of said support cable to said tower sheave;

means for rotating said tower sheave to rotate said inboard sheave and to pivotally move said loading arm about said first horizontal axis; and

means for connecting the outboard end of said loading arm to a second fluid handling means.

4,393,907

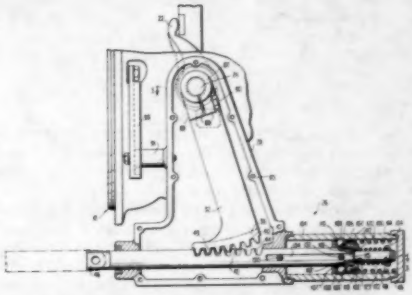
CLUTCH ASSIST APPARATUS

Victor Kronstadt, Hagerstown, Md., assignor to Mack Trucks, Inc., Allentown, Pa.

Filed Jan. 21, 1981, Ser. No. 226,867

Int. Cl.³ F16D *23/12*; **G05G** *17/00*

U.S. Cl. 192—99 S **18 Claims**



1. A clutch assist mechanism for assisting clutch disengagement comprising:

(a) a clutch release shaft for rotation between clutch-engaged and disengaged positions;

(b) a movable member for movement along a substantially linear path for rotation of said clutch release shaft;

(c) a radial member fixed to said shaft and extending radially therefrom, said radial member having a portion for engaging said movable member to translate linear movement of said movable member into rotational movement of said shaft;

(d) biasing means for biasing said movable member in a direction of the linear path corresponding to a clutch-disengaged position; and

(e) means for preventing said biasing means from assisting movement of said movable member along the linear path until after an initial movement along at least a portion of said linear path;

(f) said movable member being a rack having upstanding gear teeth, and said radial member being a sector in which said portion for engaging said movable member is arcuate and includes complementary gear teeth for engagement with the gear teeth of said rack.

4,393,908

HAMMER WITH TWO DETACHABLE HEADS

Howard W. Clay, c/o Endall Company, 5083 27th Ave., Rockford, Ill. 61109

Filed Apr. 29, 1981, Ser. No. 258,591

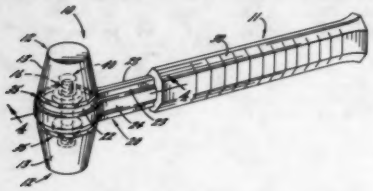
Int. Cl.³ B25D *1/02*

U.S. Cl. 145—29 A **12 Claims**

4. A hammer having a handle and two detachable heads, each of said heads comprising:

a main body made of a material capable of being cast or molded, a plate made of a material which is harder than the material of said body, said plate being located adjacent one end of said body and being formed with a central axially extending hole, wrenching flats formed around the peripheral margins of said plate and unshielded by the

material of said body, an internally threaded sleeve disposed within said body and having an outer portion located within said hole, said sleeve being joined rigidly to said plate and being made of a substance which is harder than the material of said body, a flange integral with the outer portion of said sleeve and located adjacent the outer face of said plate, the peripheral margins of said flange being located radially inwardly of the peripheral margins of said plate, a series of axially extending openings formed through said plate between the peripheral margins of said flange and the peripheral margins of said plate, a ring of



said material located on the outer face of said plate and intimately encircling said flange, and pieces of said material integrally joined to said ring and to said body and extending through said openings,

said handle comprising an elongated handle portion and further comprising a disc on one end of said handle portion, said disc being formed with an axially extending hole, a stud located with the hole in said disc and having threaded end portions extending in opposite directions from said disc and threaded into said sleeves to attach said heads to said handle.

4,393,909

UNIVERSAL ADMINISTRATION PORT

Stephen Pearson, Ingleside, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 28, 1981, Ser. No. 335,132
Int. Cl.³ B65D *41/20*
U.S. Cl. 150—8 **8 Claims**

1. A fluid container administration port for use with an associated cannula, comprising:

(a) a continuous sidewall;

(b) a cannula-pierceable membrane extending across a base of said sidewall;

(c) an inwardly tapered end continuous with said sidewall and opposite said base and said membrane;

(d) a volume-defining inner surface of said sidewall and said inwardly tapered end;

(e) said inner surface being substantially concentric about a longitudinal axis of said port taken through the center of said membrane and the center of a circular opening defined by said inwardly tapered end;

(f) such that diameter measurements, taken across said defined volume so as to span said inner surface, increase along said longitudinal axis from said membrane substantially up to said inwardly tapered end and decrease along said longitudinal axis from the commencement of said inwardly tapered end up to said end-defined circular opening;

(g) said diameter measurement at said circular opening being not greater than said diameter measurement at said membrane;

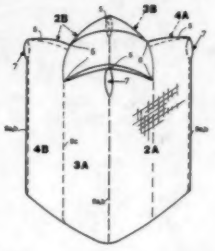
(h) wherein said diameter measurements are such that upon insertion of an associated cannula, that portion of said inner surface at said circular opening provides a circumferential seal about the associated cannula before the cannula pierces said membrane.

4,393,910

FLEXIBLE CONTAINER HAVING FOUR LIFTING LOOPS

Odd F. Rasmussen, Porsgrunn, Norway, assignor to Norsk Hydro A.S., Oslo, Norway

Filed Oct. 5, 1981, Ser. No. 308,855
Claims priority, application Norway, Oct. 29, 1980, 803222
Int. Cl.³ B65D *33/14*
U.S. Cl. 150—12 **3 Claims**



1. In a flexible container for the lifting, transportation and storage of bulk material, said flexible container including a bottom, plural side walls, an inlet opening and lifting loops, the improvement wherein:

said flexible container comprises four said lifting loops;

each said lifting loop comprises an integral extension of the material of at least portions of said side walls;

each said lifting loop has a width of no more than approximately one-quarter of the circumference of said container; and

said bottom is formed from an integral extension of the material of at least one of said side walls.

4,393,911

SAFETY LINER FOR TIRES

Mason C. Winfield, Orchard Park, N.Y., assignor to Astronics Corporation, Orchard Park, N.Y.

Filed Jul. 26, 1982, Ser. No. 401,938
Int. Cl.³ B60C *17/00*
U.S. Cl. 152—158 **13 Claims**

1. A safety liner for tires, comprising

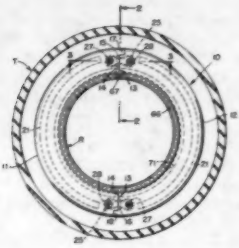
a pair of complimentary, semi-circular members made of a generally rigid, plastic material,

a flexible, generally C-shaped bearing disposed to be secured around the drop center of a tire rim with the inner peripheral surface of the bearing engaged with the outer peripheral surface of the drop center of the rim, and

means for releasably securing said semi-circular members together in the form of a ring disposed within a tire and coaxially around the outside of said bearing, and with the inner peripheral surfaces of said members being seated slidably in a circumferential groove formed in the outer surface of said bearing,

the outer diameter of the ring formed by said members being greater than that of said rim and less than the inner periphery of a tire mounted on the rim, whereby when the last-

named tire becomes flat it is engaged with the outer surfaces of said members to cause rotation of said members relative to said bearing, and



said bearing having integral, circumferential flange sections at opposite side of said groove and slidably engageable with said members to prevent lateral movement thereof when said members are rotated on said bearing.

4,393,912

PROCESS FOR THE MANUFACTURE OF TIRES BY MOLDING

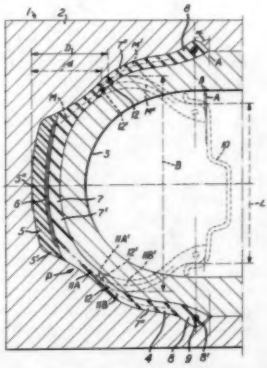
Jacques Gouttebessis, La Mouteyre, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Dec. 7, 1981, Ser. No. 327,938

Claims priority, application France, Dec. 10, 1980, 80 26258

Int. Cl.³ B60C *3/00, 13/00;* **B29H** *17/02*

U.S. Cl. 152—353 R **7 Claims**



1. A process of manufacturing a tire from one or more liquid or paste materials which solidify in a mold, the tire being formed of a crown and of two sidewalls each terminated by a reinforced bead and each without reinforcement, the mold being formed by an envelope which defines the outer toroidal surface of the tire and by a core which defines the inner surface of the tire, in which process the tire is molded in a cross section different from that of the tire when mounted on its rim but not inflated, this process being characterized by the use of a mold in which, in radial cross section,

the crown of the tire is arranged approximately the same axially and radially as in the tire mounted on its rim but not inflated,

the sidewalls have lengths practically identical to those in the tire when mounted on its rim but not inflated and median lines each formed of two consecutive segments, namely, a first segment which is rectilinear or concave towards the outside of the tire and is adjacent to the shoulder and a second segment which is concave towards the inside of the tire and is adjacent to the bead, the junction between the two segments being located at a radial distance from the crown which is greater than in the tire when mounted on its rim but not inflated, and

the beads are arranged, on the one hand, approximately the same radially as in the tire when mounted on its rim but not inflated and, on the other hand, axially outward of their position on the rim.

7. A tire manufactured by the process in accordance with claim 1.

4,393,913

TIRE AND WHEEL CONFIGURATION

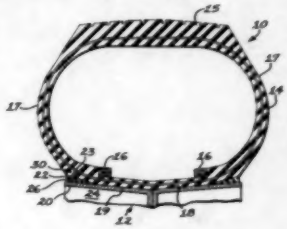
Charles E. Grawey, Peoria, and John J. Groezinger, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00758, § 371 Date Jun. 8, 1981, § 102(e) Date Jun. 8, 1981, PCT Pub. No. WO82/04224, PCT Pub. Date Dec. 9, 1982

PCT Filed Jun. 8, 1981, Ser. No. 287,541

Int. Cl.³ B60C *9/00, 5/00;* **B60B** *21/00, 25/00*

U.S. Cl. 152—364 **16 Claims**



1. In a rim assembly (12) having a rim portion (24) adapted to have mounted thereon a closed torus tire (14) having a pair of roll restraining hoops (16) and a shoulder portion (30) axially outward from each of said roll restraining hoop (16), the improvement comprising:

said rim assembly (12) including means (22) for reducing the rolling resistance of the closed torus tire (14), said means (22) including an elastomeric element (22) positioned solely between said shoulder portion of said closed torus tire and said rim portion (24) and being bonded to said rim portion (24).

7. A wheel assembly (10) comprising:

a rim portion (24) having a tire retaining periphery (18);

a closed torus tire (14) mounted on said rim portion and having a pair of roll restraining hoops (16) and a rim contacting periphery (19), said rim contacting periphery including a shoulder portion (30) positioned axially outward from each of said roll restraining hoops (16); and

a pair of elastomeric elements (22) affixed to said rim portion (24), each of said elastomeric elements (22) being positioned between one of said shoulders (30) of the closed torus tire (14) and the adjacent portion of the tire retaining periphery.

4,393,914

TIRE CHANGER WITH COMBINATION WHEEL CLAMPS AND BEAD LOOSENERS

Charles G. Leeper, Antioch, Tenn., assignor to Hennessy Industries, Inc., LaVergne, Tenn.

Filed May 22, 1981, Ser. No. 266,153

Int. Cl.³ B60C *24/06*

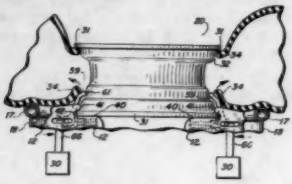
U.S. Cl. 157—1.2 **13 Claims**

1. A device for clamping a wheel and loosening the bead of a tire attached thereto, comprising:

a table to hold a wheel and tire;

a plurality of radially converging shoes located on said table and having means for clamping a wheel to said table;

a tongue extensible from at least one of said shoes; and



motor means for sequentially moving said shoes towards clamping engagement with a wheel and thereafter extending said tongue between a wheel and a tire bead to loosen the tire bead from the wheel.

4,393,915

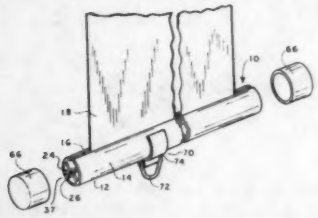
WEB SECURING DEVICE

Carl G. Olson, 705 N. Elmhurst Rd., Prospect Heights, Ill. 60070

Filed Mar. 24, 1980, Ser. No. 133,346

Int. Cl.³ A47H *13/00, 23/01*

U.S. Cl. 160—395 **5 Claims**



1. A device for attachment to a free margin of flexible webbing material, as for example a map, said device comprising: an elongated mounting strip to which the free margin of flexible webbing material may be affixed; and a rigid, tubular, elongated substantially cylindrical holder element having at least one open end, a cylindrical outer wall, a longitudinal slot within said outer wall having a width approximating the thickness of the webbing material, said outer wall being of predetermined thickness and continuous in cross-section circumferentially from one edge of said slot to the other edge of said slot, to define a cylindrical inner surface coaxial therewith, and a pair of elongated rib means within said holder element and formed integrally therewith, said rib means each being generally V-shaped in cross-section, the legs of each V being symmetrically arranged with respect to said cylindrical inner surface and diverging from diametrically spaced apices to integrally join said cylindrical inner surface and of similar thickness to said outer wall and integrally joining the interior surface of said outer wall at locations spaced apart from said slot and extending substantially the entire length thereof for rigidly supporting said outer wall to resist bending moments while leaving a major portion of the interior portion of the holder element hollow so as to minimize the weight thereof, said rib means further defining an elongated aperture communicating with said slot and being shaped to accommodate said mounting strip lengthwise through said open end with said webbing material extending through said slot, and said aperture having inner walls formed by said rib means arranged to coact with said mounting strip to facilitate impingement of said mounting strip with said aperture inner walls as an incident to the lateral shifting of said holder element; and handle means including an arcuate structure snugly engaging the cylindrical holder element and supported thereby for rotational positioning about said holder element, and being provided with a pendant pull member intermediate longitudinal edges of the arcuate structure with the said edges being selectively spaced from each other a distance permitting the pull member to be positioned in accordance with the rotational positioning of the arcuate structure behind or in front of the holder element or any point therebetween without obstructing the longitudinal slot through which the webbing material extends.

4,393,916

APPARATUS FOR PRESSURE DIE CASTING

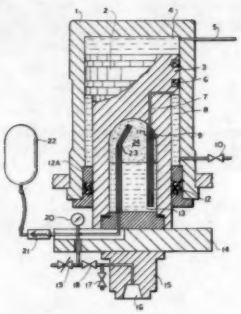
Stancho H. Vutov, and Rashko R. Slavov, both of Sofia, Bulgaria, assignors to Institute po Metaloznanie i Technologia na Metalite, Sofia, Bulgaria

Filed Apr. 2, 1981, Ser. No. 250,289

Claims priority, application Bulgaria, Apr. 2, 1980, 47207

Int. Cl.³ B22D *17/06, 18/00*

U.S. Cl. 164—119 **3 Claims**



1. An apparatus for pressure die casting by using elevated gas pressure in a die, comprising in combination,

a hydraulic press including a cylinder and a piston having an axially extending piston rod, said piston being slidably mounted in said cylinder; said piston dividing said cylinder into a first chamber and a second chamber, which chambers are filled with hydraulic liquid from a source of pressurized liquid for said hydraulic press;

die means including a die cavity are rigidly connected to said piston rod;

said piston rod including a gas retaining cavity which is in communication via first valve means with a reservoir of pressurized gas;

said gas retaining cavity containing a predetermined quantity of hydraulic liquid in its bottom portion which is in communication via a passage in said piston rod with said second chamber in said cylinder;

said second chamber being in communication with said source of pressurized liquid via second valve means;

an upper portion of said gas retaining cavity being also in communication with said die cavity via a third valve means;

and fourth valve means operatively connected to said die cavity for venting it to the atmosphere;

whereby when said third and fourth valve means are closed and the hydraulic liquid in the first chamber is pressurized via said source of pressurized liquid, the piston is caused to slidably move downwardly in said cylinder causing hydraulic liquid to flow from said second chamber into said gas retaining cavity via said passage in said piston which causes the gas contained therein to be additionally pressurized to a predetermined equilibrium and thereafter said pressurized gas being caused to flow into the die cavity via said third valve means.

4,393,917

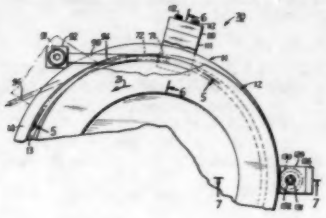
METHODS AND APPARATUS FOR CASTING AND EXTRUDING MATERIAL

Francis J. Fuchs, Jr., Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 810,457, Jun. 27, 1977, abandoned. This application Mar. 30, 1981, Ser. No. 248,733

Int. Cl.³ B22D *11/12*

U.S. Cl. 164—476 **13 Claims**



1. A method of continuously casting and extruding a material, comprising the steps of:

(a) at a feeding station, introducing the material in molten condition into an annular groove in a radially extending, first surface on a first rotary member;

(b) enclosing a portion of the annular groove in the first surface with a radially extending second surface on a second rotary member, so as to define a region of overlap between the second rotary member and the annular groove;

(c) rotating the first and second rotary members simultaneously about two different axes in such direction as to transport the molten material within said annular groove from the feeding station and partly through said region of overlap while simultaneously cooling said material to produce full solidification thereof in the course of such transportation thereof; and

(d) further utilizing the rotation of said first and second members to cause extrusion of the material from the annular groove, in solidified condition, through an extrusion die disposed in said groove with at least part thereof being within said region of overlap, said die having an aperture shaped in conformity with a desired cross-sectional configuration, thereby to form an elongated product of said desired cross-sectional configuration from said material.

4,393,918

MELTING LATENT-HEAT HEAT OR COLD EXCHANGER-STORAGE DEVICE

Jean Patry, 9, rue Saint-Paul, Paris, France (75004)

Filed Oct. 19, 1981, Ser. No. 312,845

Int. Cl.³ F28D *17/00*

U.S. Cl. 165—10 **7 Claims**

1. A heat or cold exchanger and storage device operable according to the melting latent heat effect, said device comprising:

an elongated main container divided into two halves by a longitudinal partition to create two chambers connected at one end of said main container;

a plurality of elementary containers stacked in said two chambers in a manner such that a heat carrier medium circulated through said chambers will pass around said elementary containers and will meet a homogeneous resistance;

each said elementary container comprising a pair of semi-spherical elements so shaped such that when assembled there will be a gap therebetween permitting circulation therethrough of the heat carrier medium;

each said element being filled with a heat and/or cold storage medium capable of generating a substantial quantity of heat when melting;

each said element being formed of a deformable material capable of absorbing volumetric variations resulting from crystallization; and

each said element containing therein an air pocket to produce an expansion inherent to the device.

4,393,919

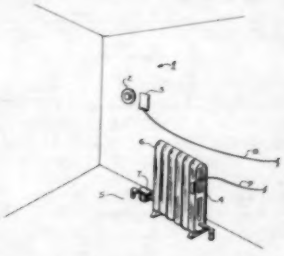
THERMAL ENERGY METER

Cary R. Anderson, 428 E. Chapel St., Rockton, Ill. 61072

Filed Sep. 2, 1980, Ser. No. 183,433

Int. Cl.³ G01K *17/00*

U.S. Cl. 165—11 R **7 Claims**



1. A device for monitoring the thermal energy used by a single unit of a multi-unit building having a central space conditioning system said device comprising an energy monitoring circuit having a sensor unit comprising two temperature sensors separated by a solid sensor element, a differencing means to determine the temperature difference between said two temperature sensors, and a recording and display means for the totalization and reading of the energy consumption monitored wherein said sensor unit is thermally coupled to a space conditioning heat exchanger.

4,393,920

MANIPULATOR FOR WORKING IN A HEAT EXCHANGER

Michitsune Shima, Kobe; Shiso Kihara, Akashi; Takeo Omichi, Kobe; Taenji Igarashi, Shiga, and Kenji Mangetsu, Kameoka, all of Japan, assignors to The Kansai Electric Power Co., Inc., Osaka; Kyushu Electric Power Co., Inc., Fukuoka; Shikoku Electric Power Co., Inc., Takamatsu and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, all of, Japan

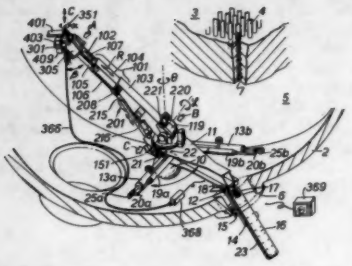
Filed Feb. 17, 1981, Ser. No. 235,029

Int. Cl.³ F28F *11/00*

U.S. Cl. 165—11 A **7 Claims**

1. A manipulator for working in a heat exchanger, the heat exchanger including a water chamber delimited by a drum end plate and a header plate on which a large number of heat transfer tubes of a vertical type heat exchanger are arrayed, the manipulator comprising a support frame disposable within said water chamber; a freely extensible and contractible main arm having a first base end portion mounted on said support frame and a tip end portion, said main arm being rotatable about said first base end portion and vertically swingable about a first fulcrum at said first base end portion; a sub-arm having a

second base end portion mounted at said tip end portion of said main arm, said sub-arm being rotatable about said second base end portion and vertically swingable about a second fulcrum at said second base end portion, said sub-arm being positionable in parallel to said header plate; a vertically movable clamp



shaft insertable into one of said large number of heat transfer tubes, coaxial with the rotational axis of said sub-arm; and a position detector for detecting the position of said clamp shaft for use in positioning said clamp shaft so as to become coaxial with said one of said large number of heat transfer tubes, provided on said clamp shaft.

4,393,921

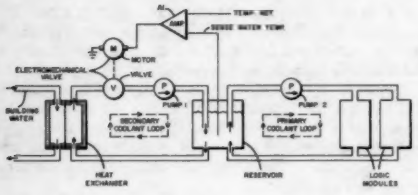
CIRCUIT CONTROLLING COOLANT FLOW TO A NON-LINEAR HEAT EXCHANGER THROUGH A NON-LINEAR ELECTROMECHANICAL VALVE

Terry B. Zbinden, Maple Grove, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Sep. 13, 1982, Ser. No. 397,954

Int. Cl.³ G05D *15/00*

U.S. Cl. 165—40 **5 Claims**



1. In a thermal exchange coolant loop wherein coolant from a reservoir is pumped as regulated by the position of an electromechanical valve, through a heat exchanger for heat transfer, an electrical control circuit for said electromechanical valve to the end that the temperature of said coolant within said reservoir may be essentially maintained, via said heat transfer, at a reference constant, set point, temperature level as determined by an externally supplied signal, said electromechanical valve control circuit comprising;

position potentiometer means for providing a linear position signal output responsively to the position of said electromechanical valve;

non-linear compensator means responsive to said position signal output of said position potentiometer means for deriving a heat transfer signal output which is approximately linear with the coolant flow controlled by said electromechanical valve;

temperature sensor means for providing a temperature signal output, essentially linear over a temperature range, responsively to the temperature of said coolant within said reservoir;

differential amplifier means for receiving said heat transfer signal output from said non-linear compensator means, said temperature signal output from said temperature sensor means, and said externally supplied signal which corresponds to said reference constant, set point, temperature level and for producing an error signal which is the difference between said ((externally supplied, set point temperature signal) minus (temperature signal)) and said (heat transfer signal);

drive amplifier means for producing a positioning drive signal to said electromechanical valve responsively to said error signal from said differential amplifier means.

4,393,922

ENGINE UNIT WITH LUBRICANT COOLING

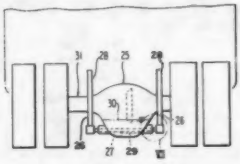
Friedrich Bährle, Kernen, and Helmut Wulf, Ostfildern, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 22, 1981, Ser. No. 227,372

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1980, 3002155

Int. Cl.³ F28F *15/00*

U.S. Cl. 165—41 **4 Claims**



1. A differential gear of a vehicle driving axle lubricated by means of a liquid lubricant, having a lubricant collecting pipe as well as having a lubricant cooling system, comprising a heat pipe, with its heat-receiving part, that is circular in its cross section, projecting directly into the lubricant collecting space in an area of an especially high reflux current or turbulence of the lubricant in the collecting space; the heat-emitting part of the heat pipe, in the operational installation position of the differential gear, is geodetically higher than its heat-receiving part; and the heat-emitting part of the heat pipe is formed in a plate-shaped manner, of two sheet-metal plates that are welded to one another so that they are hermetically tight, with the heat-emitting part being exposed to ambient air and being aligned in the driving direction of the vehicle, where the surface in the heat-emitting part of the heat pipe that can be used for the formation of the condensate is larger than the surface in the heat-receiving part that can be used for the evaporation.

4,393,923

CONTOUR-ADAPTIVE ATMOSPHERIC HEAT EXCHANGE APPARATUS

Jack J. Press, 17426 Plaza Destacado, San Diego, Calif. 92128

Filed Sep. 2, 1980, Ser. No. 183,490

Int. Cl.³ F28F *3/12, 21/06*; F24J *3/02*

U.S. Cl. 165—46 **2 Claims**

1. An atmospheric heat transfer apparatus which is capable of bending over structures, said apparatus consisting of:

a sealed container having front and rear walls which are made of thin, pliable sheet material which have smooth inner surfaces capable of contacting each other over substantially their entire inner surfaces so as to provide a planar liquid passageway therebetween;

said container having an inlet and an outlet for the liquid so that the inlet can be positioned above the outlet to cause the liquid to flow by gravity and cause a negative pressure within the container which draws the container walls toward one another with only the liquid flowing therebetween; and

means for relieving compression contact between the container walls where any bend occurs in the container, the

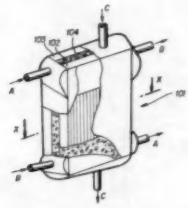
compression contact relieving means being located only where such bend occurs.

4,393,924

HEAT EXCHANGE APPARATUS WITH USE OF HYDROGEN STORING MATERIAL

Takayoshi Asami, Ohtsu, and Hidekazu Sonoi, Kobe, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jun. 16, 1981, Ser. No. 274,194
Claims priority, application Japan, Jun. 23, 1980, 55-85700
Int. Cl.³ F28D *21/00*
U.S. Cl. 165—104.12 **7 Claims**



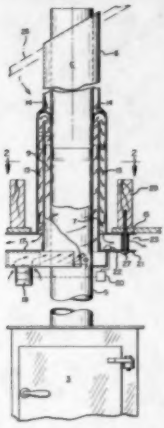
1. A heat exchange apparatus for use with hydrogen storing material, comprising;
- a hydrogen reservoir;
- a heat source;
- a heat exchanger having a low temperature fluid pathway defined by first closed conduit means in said heat exchanger and a high temperature fluid pathway independent of said low temperature fluid pathway and defined by second closed conduit means in said heat exchanger;
- pressure controlling means;
- a heat utilizing system; and
- a regenerator chamber packed with a heat storing material and disposed only between said high temperature fluid pathway and said low temperature fluid pathway of said heat exchanger, wherein the high temperature fluid pathway is connected to said heat source and the low temperature fluid pathway is connected to said heat utilizing system, and said regenerator chamber is connected via said pressure controlling means to said hydrogen reservoir.

4,393,925

STOVE PIPE HEAT EXTRACTOR

Kenneth J. Jacobsen, 14005 SW. Bonnie Brae Ct., Beaverton, Oreg. 97005, and Jerome F. Moshofsky, 9019 SW. 15th St., Portland, Oreg. 97219

Filed Nov. 2, 1977, Ser. No. 847,798
Int. Cl.³ F24F *3/02*
U.S. Cl. 165—122 **3 Claims**



1. A stove pipe heat extractor comprising:
- a hot gas conducting inner pipe having a longitudinal central axis;
- an inner jacket surrounding the inner pipe, the pipe and inner jacket defining a first air path;
- an outer jacket surrounding the pipe and inner jacket, the inner and outer jackets defining a second air path;
- means for introducing air into the first air path in a spiral upward air flow pattern;
- means for reversing air flow from the first air path and directing the flow downward in a spiral flow pattern into the second air path;
- and an air exit vent operatively connected to the second air path.

4,393,926

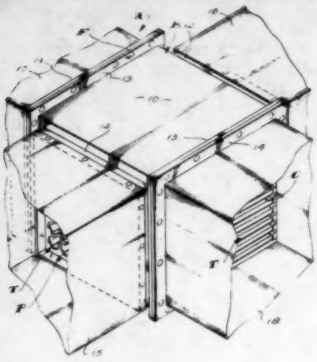
CLOVER HEAT EXCHANGER CORE

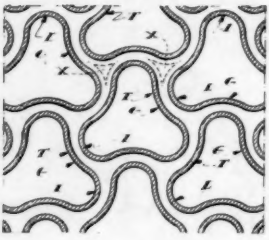
Gary H. Appel, 2235 W. 25th St., San Pedro, Calif. 90732

Filed Apr. 6, 1981, Ser. No. 251,354
Int. Cl.³ F28D *7/00, 7/10*
U.S. Cl. 165—165 **9 Claims**

1. A heat exchanger comprising a plurality of elongate parallel fluid medium conducting tubes, a first fluid handling means communicating with the opposite ends of the tubes to deliver a first fluid medium into one end and to receive said medium at the other end thereof, a second fluid handling means directing a second fluid medium about the exterior of and between the tubes, each tube is formed with an uneven number of circumferentially spaced longitudinally extending grooves and circumferentially spaced longitudinally extending lobes, each lobe occurs between a pair of adjacent grooves, the grooves have concave substantially radially outwardly disposed outside bottom surfaces and the lobes have substantially radially outwardly disposed convex outside surfaces, the radius of said convex surfaces is less than the radius of said concave surfaces,

the lobes at the sides of each tube projecting toward adjacent tubes extend to the related grooves of said adjacent tubes with





the concave and convex surfaces of the related lobes and grooves in spaced relationship.

4,393,927

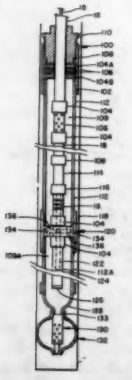
APPARATUS FOR POSITIONING A TREATING LIQUID AT THE BOTTOM OF A WELL

Mortimer Singer, 2320 Plaza del Grande, Las Vegas, Nev. 89102

Continuation-in-part of Ser. No. 94,381, Nov. 15, 1979, Pat. No. 4,267,888. This application Mar. 19, 1981, Ser. No. 245,361

Int. Cl.³ E21B *37/00, 37/06*

U.S. Cl. 166—105 **11 Claims**



1. In a liquid producing well having installed at least a string of tubing extending from the surface to the bottom, a standing valve, a sucker rod pump including a traveling valve, and a string of sucker rods, apparatus for positioning a selected volume of a selected fluid in the bottom of said well without disturbing said pump, rods, tubing, or standing valve, comprising;

(a) a first opening in said tubing above said sucker rod pump;

(b) a shroud, or cylindrical pipe, outside of, said tubing string, forming an annulus between said tubing and said shroud, said shroud extending to a point below the inlet to said sucker rod pump, from a point above said first opening; means to seal said shroud to the outside of said tubing string above said first opening;

(c) crossover means inserted into said tubing string in the vicinity of the inlet to said sucker rod pump; said crossover means sealed to said shroud; permitting radial flow of well fluid from outside said shroud to the inlet to said sucker rod pump, and also permitting longitudinal flow of fluid down said annulus from said first opening to the bottom of said shroud;

(d) an overpressure relief valve set to open at a selected fluid pressure on its inlet, said relief valve positioned at and closing off the bottom end of said shroud;

(e) at the mouth of said well, means to close off the top of said tubing string; and

(f) means to inject at least a selected first volume of a selected first fluid, into said closed top end of said tubing at a selected pressure above atmospheric pressure.

4,393,928

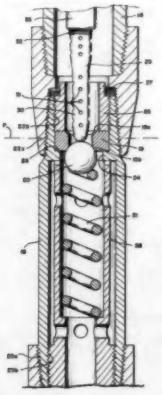
APPARATUS FOR USE IN REJUVENATING OIL WELLS

Charles E. Warnock, Sr., P.O. Box 509, Ventura, Calif. 93002

Filed Aug. 27, 1981, Ser. No. 296,640

Int. Cl.³ E21B *43/00*

U.S. Cl. 166—105 **2 Claims**



1. An apparatus for use in rejuvenating oil wells wherein such rejuvenation involves injecting steam through a pipestring and holding the steam under pressure in the well for a period of time before a production pump is lowered into the pipestring to resume production pumping operations, including, in combination:

(a) a sub incorporating a check valve comprising a valve seat, ball and spring biasing the ball against the seat, said sub having exterior upper and lower threads for insertion into the pipestring so that steam can pass down through the pipestring and through the check valve to the surrounding formations, the check valve blocking back flow of steam into the pipestring, said sub having internal threads at its upper and lower ends, and a reduced diameter central opening defining an annular shoulder facing said upper end, said seat being receivable in said upper end

for seating on said annular shoulder; a threaded collar received in said upper internal threads to hold said seat against said annular shoulder; and a spring cage threadedly received in said lower internal threads of said sub for holding said spring for said check valve in a manner to urge said ball upwardly through the reduced diameter central opening against said valve seat, whereby said check valve can be easily disassembled for maintenance purposes; and

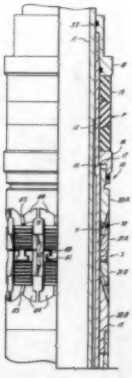
(b) a hollow probe member having a lower narrow nose portion with a plurality of openings in its lateral wall, the diameter of said nose portion being less than the diameter of the seat for said check valve, the upper end of said probe member having threads for threaded engagement with the lower end of said production pump such that the probe member can be substituted for the normal pump screen threadedly held therein, whereby after steam has been injected into the well, the check valve will hold the pressure and block back flow so that said production pump can immediately be lowered while said well is cooling and the pressure is dropping, said probe member serving to enter said valve seat and unseat said ball to thereby open said check valve and permit production pumping of the well to resume.

4,393,929

WELL PACKERS AND SLIP ASSEMBLIES FOR USE THEREWITH

Neil H. Akkerman, Kingwood, Tex., assignor to AVA International, Houston, Tex.

Filed Feb. 17, 1981, Ser. No. 233,627
Int. Cl.³ E21B *33/128, 33/129*
U.S. Cl. 166—134 **13 Claims**



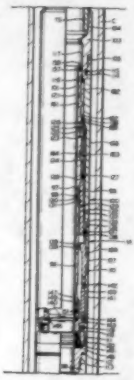
1. A packer for use in closing off an annular space about a pipe string within a well bore, comprising a tubular member adapted to be connected as part of the pipe string, first and second sleeves surrounding the tubular member, normally contracted packing and slip elements carried about the first sleeve, means for expanding the packing and slip elements into engagement with the well bore in response to movement of one of said sleeves from an axially extended to an axially retracted position with respect to the other sleeve, means forming an annular chamber in which fluid at a lesser pressure than ambient well fluid may be contained and including a piston on said one sleeve, whereby said well fluid urges said one sleeve toward retracted position, and a circumferentially expandible and contractible ring disposed within said chamber and having wedging surfaces and ratchet teeth on its opposite sides engageable with corresponding parts on said one sleeve and one of the other sleeve and tubular member for locking said sleeves against extension as said one sleeve is moved to retracted position.

4,393,930

SUBTERRANEAN WELL PRESSURE SURGING TOOL

Richard J. Ross, and Luis E. Mendez, both of Houston, Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Mar. 18, 1981, Ser. No. 244,997
Int. Cl.³ E21B *37/08*
U.S. Cl. 166—188 **8 Claims**



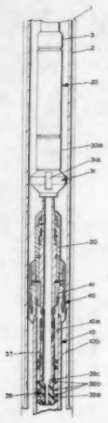
1. In a surging apparatus for cleaning particulates from the perforations or the production formation face of a subterranean well, the apparatus including a surge chamber connectable to a tubing string and insertable in the well casing at atmospheric pressure, and a pressure actuated lower valve positionable between the lower end of the atmospheric pressure surge chamber and the casing bore adjacent to the casing perforations, said pressure operated lower valve being actuated by a predetermined increase in the fluid pressure in the annulus between the casing and the tubing string, the improvement comprising: a packer apparatus carried on said tubing string for selective sealing engagement at a predeterminable position in the well; a flapper valve pivotally mounted in the tubing string above the atmospheric pressure surge chamber and normally closing the bore of the tubing string; an axially shiftable actuating sleeve normally engaging the perimeter of said flapper valve to maintain same in a closed position with respect to the bore of the tubing string; radially shiftable locking means normally securing said actuating sleeve in said valve closing position; a retainer sleeve normally holding said locking means in said normal locking position, said retainer sleeve having a lower end disposed in a fluid pressure chamber communicable with the bore of the tubing string; shear means preventing movement of said retaining sleeve from its normal locking position with respect to the locking means, whereby an increase in fluid pressure in said tubing string bore above a predetermined level effects the shearing of said shear means and the axial movement of said retainer sleeve to release said locking means; a piston shoulder on said actuating sleeve exposed to fluid pressure in the tubing string bore by the pressure induced movement of said retainer sleeve to effect the shifting of said actuating sleeve to an unlocked position relative to said flapper valve; and biasing means for urging said flapper valve to its open position.

4,393,931

COMBINATION HYDRAULICALLY SET HANGER ASSEMBLY WITH EXPANSION JOINT

John F. Muse; Rudy B. Callihan; Bobby F. Goad, all of San Antonio, and Clyde S. Wainwright, Jr., McQueeney, all of Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Apr. 27, 1981, Ser. No. 257,839
Int. Cl.³ E21B 19/10
U.S. Cl. 166—208 5 Claims



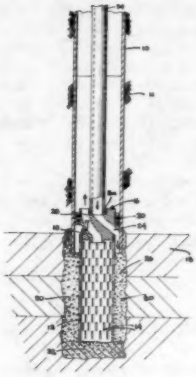
1. Appartus for cementing a liner in the bottom of a subterranean well bore below the well casing comprising, in combination: a torque transmitting, annular expansion joint having its upper end adapted to be secured to a tubular work string; an annular running tool secured to the bottom end of said torque transmitting, annular expansion joint, said running tool and said expansion joint defining interconnected axial bores having substantially the same I.D. as the tubular work string; a liner hanger secured in surrounding relationship to said running tools by left hand threads; a liner sleeve assembly having its top end secured to the lower portion of said liner hanger; said liner sleeve assembly including means for attaching a cement float shoe at its bottom end and a landing collar sleeve disposed above the cement float shoe; shearable valve means in said landing collar permitting the development of a predetermined fluid pressure in the bore of said running tool; said liner hanger having a plurality of slips disposed around its exterior periphery and movable outwardly to engage the well casing; resilient means urging said slips outwardly; axially movable means on said running tool retaining said slips in an inwardly retracted position during run-in of the aforesaid apparatus; an annular piston formed on said axially movable means, said running tool defining an annular cylinder chamber cooperable with said annular piston and in fluid communication with said bore of said running tool, whereby the application of a predetermined fluid pressure to the tubular work string effects displacement of said piston to release said slips to expand into engagement with the well casing and set the hanger; said axially movable means including a ring axially fixed on said axially movable means but rotatable relative thereto; a plurality of axial fingers secured to said ring and respectively engagable with said slips, whereby right hand rotation of said running tool relative to said liner sleeve assembly will alternatively release said slips and set the hanger and permit removal of the running tool; said shearable valve means being sheared and displaced downwardly in the liner by an increase of fluid pressure above said predetermined value, thereby permitting flow of cementing fluid into said liner.

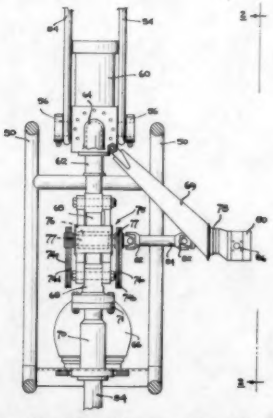
4,393,932

METHOD AND APPARATUS FOR UNIFORMLY PACKING GRAVEL AROUND A WELL CASING OR LINER

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Mar. 16, 1981, Ser. No. 243,846
Int. Cl.³ E21B 33/13
U.S. Cl. 166—249 8 Claims





1. A method for uniformly packing gravel around the perforated region of a well liner comprising the steps of

installing a casing through overburden to a fluid producing formation,

installing a liner at the bottom end of said casing in said formation, said liner having apertures therein for passing said fluid to the interior thereof,

pouring gravel into the region surrounding said liner to inhibit the flow of foreign material through said apertures into the interior of said liner,

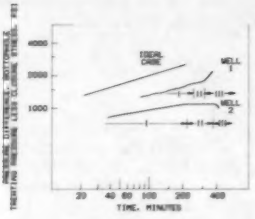
generating high level sonic elastic wave energy, and

coupling said sonic energy to the gravel through an elastic column coupled to the liner to effect the fluidization thereof and the resultant uniform distribution and compaction of said gravel without voids therein around the liner.

4,393,933
DETERMINATION OF MAXIMUM FRACTURE PRESSURE

Kenneth G. Nolte, and Michael B. Smith, both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 155,873, Jun. 20, 1980, abandoned. This application Apr. 6, 1981, Ser. No. 251,666
Int. Cl.³ E21B 49/00
U.S. Cl. 166—250 8 Claims



1. A method of determining the maximum bottomhole treating pressure which should be attained during the fracturing of a subterranean formation at a first wellbore extending into the formation, which comprises

extending a fracture into the formation from a second wellbore extending into the formation by injecting fluid into the fracture at a rate sufficient for extending said fracture into the formation until the change in the bottomhole treating pressure is substantially zero during the injection of the fluid,

measuring at the second wellbore the bottomhole treating pressure,

determining the bottomhole treating pressure at which the change in bottomhole treating pressure during the formation of the fracture extending from the second wellbore is substantially zero, and

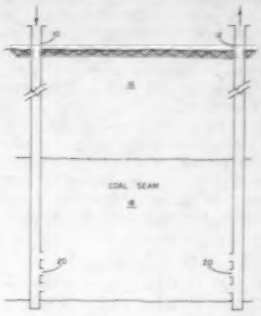
taking the sum of said determined bottomhole treating pressure less the in situ closure stress of the formation at the second wellbore plus the in situ closure stress of the formation at a said first wellbore extending into the formation as the maximum bottomhole treating pressure which should be attained during the fracturing of the formation at said first wellbore.

4,393,934
CONDITIONING A COAL SEAM PRIOR TO IN-SITU GASIFICATION

Joseph G. Savins, and James C. Meirose, both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 25, 1981, Ser. No. 296,039
Int. Cl.³ E21B 43/24
U.S. Cl. 166—261 10 Claims

1. A method for conditioning a subsurface wet coal seam prior to in-situ gasification wherein combustion of a portion of the coal in said seam has been initiated and is maintained by injection of a combustion-supporting gas into said seam through an injection well whereby there results an in-situ combustion front containing hot combustion gases which move toward a spaced production well and movement of this front displaces the hot combustion gases into the production well for recovery, the improvement comprising injecting into said coal seam via said injection well a wettability alteration fluid, said wettability alteration fluid capable of decreasing the water content of said coal and altering the wettability of said coal thereby increasing the permeability thereof to the flow of gas therethrough; recovering fluids including the wettability alteration fluid from said coal seam via said production well, and continuing to inject said wettability alteration fluid into said coal seam until the permeability thereof to the flow of said



combustion-supporting gas therethrough has increased to a maximum extent.

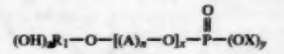
4,393,935
STIMULATION OF GAS WELLS WITH PHOSPHATE ESTER SURFACTANTS

William B. Walton, Cleburne, Tex., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

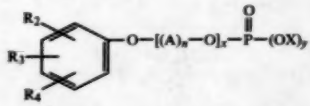
Continuation-in-part of Ser. No. 154,651, May 30, 1980, Pat. No. 4,278,129. This application Mar. 30, 1981, Ser. No. 249,098
The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.
Int. Cl.³ E21B 43/22
U.S. Cl. 166—263 10 Claims

1. A method of treating gas-bearing subterranean formations to improve permeability thereof and increase or restore production of gas comprising introducing into said formation through a producing means in fluid communication with said gas-bearing subterranean formation, a treating fluid comprising:

(A) an aqueous solution of about 5 to about 50 weight percent of an alkyl or aralkyl polyoxyalkylene phosphate ester surfactant having the formula:



(I)



(II)

wherein R_1 represents an alkyl radical containing from about 10 to 18 carbon atoms, R_2 represents an alkyl radical of about 5 to about 27 carbon atoms or a cycloalkyl radical and radicals derived from mineral oils containing alkyl, cycloalkyl and mixed alkylcycloalkyl radicals having from about 12 to 27 carbon atoms, R_3 and R_4 represent either hydrogen or alkyl of from about 1 to 22 carbon atoms and the higher alkyls defined by R_1 and cycloalkyls defined by R_2 or radicals derived from mineral oils; A represents the residue of ethylene oxide, ethylene oxide and tetrahydrofuran, or mixed lower alkylene oxides selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide, alone or including tetrahydrofuran, wherein the total molecular weight of said ester is about 500 to about 1500, and wherein A can be heteric or block in molecular configuration; n represents the degree of oxyalkylation; x and y are 1 or 2, the sum of x and y is 3 and z is an integer of 0 to 5; X is hydrogen or

a monovalent cation selected from at least one of the group consisting of an alkali metal, and ammonium; and thereafter,

(B) injecting water into the pore space adjacent to the well bore in amounts sufficient to displace the aqueous solution of said phosphate ester out into the formation,

(C) retaining said aqueous solution of said phosphate ester and water within said formation for a period of not less than 24 hours and

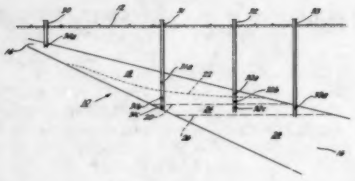
(D) thereafter, pumping and/or displacing said aqueous solution of said phosphate ester and said water from said formation into the well bore by injecting water into said formation by an injection means in fluid communication with said gas-bearing subterranean formation to produce the desired gas through said producing means.

4,393,936

METHOD FOR THE ENHANCED RECOVERY OF OIL AND NATURAL GAS

Virgil A. Josendal, Pomona, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Sep. 21, 1981, Ser. No. 303,957
Int. Cl.[3] E21B 43/22
U.S. Cl. 166—263 28 Claims



1. A method for the recovery of hydrocarbons from a subterranean formation containing both natural gas and liquid petroleum, said formation having an upper first zone containing said natural gas, said method comprising the steps of:

(a) introducing a gaseous displacement fluid through a first well communicating with said first zone so as to displace at least a portion of said natural gas from said first zone to a second well and recovering said portion of natural gas through said second well; and

(b) thereafter introducing an oil-miscible displacement fluid into said formation at a selected pressure so as to displace at least a portion of said liquid petroleum to a recovery well, and recovering said portion of liquid petroleum through said recovery well.

4,393,937

OLEFIN SULFONATE-IMPROVED STEAM FOAM DRIVE

Richard E. Dilgren, Houston, and Kenneth B. Owens, Spring, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 25, 1981, Ser. No. 247,425
Int. Cl.[3] E21B 43/24
U.S. Cl. 166—272 29 Claims

1. A steam-foam-forming composition useful in the displacement of oil within the pores of or a production of oil from an oil-containing reservoir, consisting essentially of (a) water, present in the composition, at a temperature substantially equalling its boiling temperature at the reservoir pressure, in both a liquid phase and a vapor phase of steam having a quality of at least about 30% but not more than about 80%, (b) an electrolyte, present in the liquid phase in an amount between about 0.1 and 5 percent by weight, calculated on the weight of the liquid phase, (c) a surfactant component, present in the liquid phase in an amount between about 0.01 and 5 percent by weight, calculated on the weight of the liquid phase, said surfactant component comprising in substantial part olefin sulfonate obtained by hydrolysis and neutralization of the product of reacting sulfur trioxide with C_{14} to C_{20} olefins, and (d) a noncondensable gas, present in the vapor phase in an amount between about 0.0003 and 0.3 percent by mol, calculated on total mols in the vapor phase.

19. In a process for displacing oil within an oil-containing subterranean reservoir by flowing a steam-containing fluid in conjunction with a surfactant component through the pores of a relatively steam-permeable zone with said reservoir, the improvement which comprises: employing as the fluid flowed through the pores of the reservoir the steam foam-forming composition of claim 1.

4,393,938

TREATING WELLS WITH ION-EXCHANGE-PRECIPITATED SCALE INHIBITOR

Jimmie B. Lawson, and Edwin A. Richardson, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 9, 1981, Ser. No. 252,566
Int. Cl.[3] E21B 43/16, 43/25; C09K 3/00
U.S. Cl. 166—279 5 Claims

1. A well treating process for inhibiting scaling by fluid which is produced from a clay-containing subterranean reservoir which tends to exchange cations with those contained within an injected aqueous solution, comprising:

dissolving within an aqueous solution of relatively neutral pH (a) at least one nitrogen-containing phosphonate scale inhibiting compound which contains scale-inhibiting anions that form multivalent cation salts which are only slightly soluble at the pH of the solution and (b) enough of at least one substantially neutral salt to both provide a ratio of monovalent-to-multivalent cations of at least about 100 and to substantially saturate the solution with respect to multivalent cation salts of the scale-inhibiting anions;

injecting said solution into a portion of said reservoir which (a) has a significant tendency to exchange cations with those contained within an injected aqueous solution and (b) contains a significant proportion of adsorbed multivalent cations; and,

controlling the rate at which said solution is injected so that at least some portions of that solution remain relatively near the well long enough to induce a significant precipitation of scale inhibitor salt due to the ion-exchange-induced addition of multivalent cations to the solution.

4,393,939

CLAY STABILIZATION DURING OIL AND GAS WELL CEMENTING OPERATIONS

Charles W. Smith, and John K. Borchardt, both of Duncan, Okla., assignors to Halliburton Services, Duncan, Okla.

Filed Apr. 20, 1981, Ser. No. 255,963
Int. Cl.[3] E21B 33/138
U.S. Cl. 166—293 24 Claims

1. A process for filling a zone adjacent to a permeable formation containing clays and treating said clays with a clay stabilizing organic cationic polymer comprising:

mixing an aqueous inorganic cement slurry containing a water soluble clay stabilizing organic cationic polymer, said polymer having a molecular weight of about 400–6,000,000 and containing cationic groups of nitrogen, sulfur, or phosphorous or combinations thereof, wherein said polymer is added to said slurry in an effective concentration to produce a filtrate containing polymer in an amount of at least about 0.1% by weight of filtrate; and

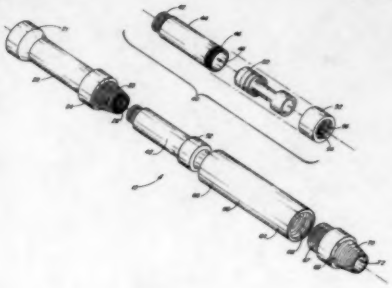
introducing said aqueous cement slurry into said zone.

4,393,940

RETRIEVABLE FLOAT VALVE ASSEMBLY

Larry V. Cooper, Lake Charles, and Michael W. Sloane, Sr., Egan, both of La., assignors to Ace Fishing & Rental Tools, Inc., Lake Charles, La.

Filed Oct. 28, 1980, Ser. No. 201,580
Int. Cl.³ E21B *34/08*
U.S. Cl. 166—325 10 Claims



1. A retrievable float valve housing tool assembly for placement in a drill string comprising:

a. a sub member having on one end portion thereof, upper drill string connection means for connecting said sub to a drill string, said sub being open-ended providing between the open ends a continuous fluid conveying bore;

b. lower drill string connection means on the lowermost portion of said sub for removably connecting said sub at its lower end to a drill string which depends downwardly therefrom;

c. float valve canister means attachable during operation to and supported by said sub member for housing a float valve therewithin, said canister means having a continuous fluid conveying bore from one end portion to the other thereof and defining therewithin a float valve receptive space; and

d. attachment means for attaching said canister means to said sub, said means comprising a connector on the canister means which attaches to said sub member at the lower portion thereof independently of the sub member/lower drill string connection, so that disassembly of the sub member/lower drill string connection alone allows removal of the upper portion of the drill string with the sub member and the canister means.

4,393,941

CHIMNEY FIRE SNUFFER

Barry A. Stevens, Box 122, Leland Ave., North Springfield, Vt. 05150

Filed Mar. 4, 1981, Ser. No. 240,437
Int. Cl.³ A62C *13/24*
U.S. Cl. 169—70 3 Claims

1. A chimney fire snuffer for attachment to the end of a garden hose or the like for lowering through a chimney for extinguishing chimney fires caused by accumulated creosote on the interior surfaces of the chimney and tending to block the chimney interior, said snuffer comprising:

an elongated heavy metal cylindrical body,

a bore extending axially of said body from one end thereof,

a plurality of spray nozzles mounted to the periphery of said body and forming a circumferentially spaced array about said body,

said spray nozzles each bearing a fine spray hole opening to the body bore,

means for sealably coupling one end of said body about said bore to said hose for filling said bore with water under pressure,

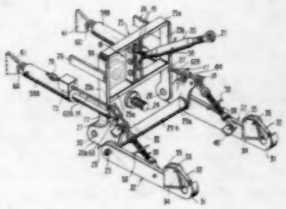
and wherein said heavy metal body terminates at the end remote from said hose coupling means in a solid conical end and functioning to seal off said bore at that end and to break through accumulated creosote tending to block the chimney passage when lowered at the end of the garden hose, and wherein water solely in fine water spray mist form is directed radially of said heavy metal body to quickly extinguish the flames with minimal water damage to the chimney interior and the building bearing the chimney.

4,393,942

VEHICLE-SUPPORTED THREE-POINT COUPLING AND POSITION RESPONSIVE FLUID BLOCKING DEVICE THEREFOR

Guy Mijot; Leon Derycke, both of Reims; Didier Dienne, Guignicourt, and Roger Martinot, Reims, all of France, assignors to Attelages Lemoine - La Mecano - Soudure Remoise, Reims, France

Filed Feb. 11, 1980, Ser. No. 120,420
Claims priority, application France, Feb. 16, 1979, 7904034
Int. Cl.³ A01B *63/10*
U.S. Cl. 172—2 16 Claims



1. A vehicle-supported three-point coupling assembly for coupling an implement to one end of said vehicle, wherein said coupling assembly comprises:

a rectangular frame assembly fixedly mounted to said vehicle, said frame assembly including a pair of vertically extending sides, a pair of horizontally extending sides interconnecting said vertically extending sides and supporting a yoke for receiving an end of a thrust bar;

a cross-bar assembly including a pair of traction bars pivotally connected to vertically extending support brackets at one end and extending horizontally away from said vertically extending brackets, said support brackets pivotally connected to said vertically extending sides, said support brackets further being interconnected by a tubular bar, said traction bars supporting at a remaining end thereof an implement holding means, whereby said cross-bar assembly including said traction bars can pivot in a vertical direction pivoting said implement holding means;

first and second screw adjustment means each connecting one of said vertically extending brackets to a respective one of said traction bars, said screw adjustment means

determining the angular relationship between said cross-bar assembly and said brackets;

a fluid operated jack assembly connected to said vehicle and to said support brackets;

conduit means supplying an operating fluid to and from said jack assembly;

a shutter block means for blocking fluid flow through said jack assembly, said shutter block means having an actuator responsive to a predetermined relative position of said support bracket with respect to said vehicle; and

valve means for controlling the direction of fluid flow through said conduit means and said jack assembly, whereby said cross-bar assembly moves vertically until said support bracket arrives at said predetermined relative position with respect to said vehicle.

4,393,943

TELESCOPING CARRIER FOR FORESTRY EQUIPMENT

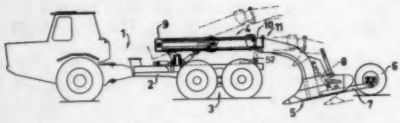
Albert Andersson, Skelleftea, Sweden, assignor to Stiftelsen Industriellt Utvecklingscentrum, Skelleftea, Sweden

Filed Feb. 21, 1979, Ser. No. 13,616

Claims priority, application Sweden, Feb. 21, 1978, 78019908

Int. Cl.³ A01B *61/04*

U.S. Cl. 172—260.5 **13 Claims**



2. A carrier adapted to be supported on a vehicle, one end of the carrier being provided with means for detachably attaching an implement for forestry cultivation, and the carrier being capable of being connected to the vehicle at at least one connection means between the ends of the carrier, characterized in that the connection means comprises a vertical axle permitting the carrier to be rotated about a vertical axis and in that the carrier consists of at least two telescopically movable members, one of which is capable of being connected to the vehicle by said connection means and another of which is provided with said means for detachably attaching said implement for forestry cultivation, the members being interconnected by a device consisting of a hydraulic circuit including a hydraulic double-acting piston-cylinder means connected to the telescoping members, and an accumulator, the device exerting a force, the force being applied by fluid pressure, the force being operable to urge the telescopically movable members to telescopically contract the contracting force being adapted to urge the implement against a towing resistance toward said vehicle and said device being provided with a hydraulic pressure relief valve between supply and discharge conduits to the piston-cylinder means and set to a predetermined value so that when the towing resistance exceeds the predetermined value, the force urging the members to contract is overcome by said resistance, thus permitting relative movement between the telescopically movable members and permitting said force to retract the members when the towing resistance no longer exceeds the predetermined value, and the device further comprising a direction control valve for said piston-cylinder means, the relief valve being set at a pressure which is higher than the pressure for the direction control valve.

4,393,944

DRILL RIG

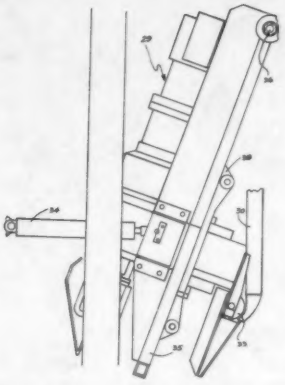
Hans Gugger, and John Ackland, both of Brisbane, Australia, assignors to Warman International Limited, Australia

Filed Sep. 11, 1980, Ser. No. 186,298

Claims priority, application Australia, Sep. 18, 1979, PE0543

Int. Cl.³ E21B *7/02, 15/04*

U.S. Cl. 173—28 **5 Claims**



1. A mobile drill rig comprising:

a mast having a pair of forward and rear mast members connected to each other;

a base frame located at the lower extremities of said mast members;

a rotation head comprising a variable speed axial piston motor;

a main gear box connected to the output of said piston motor;

a planetary drive adapted to be connected to the input of the main gear box, said rotation head being mounted directly between the mast members for axial movement along the mast members, with the drill line located between the pair of forward mast members; and

a cradle located at the top of the mast such that the rotation head can move along said mast members into said cradle, said cradle being pivotally connected to said mast members so as to be pivotal about a horizontal axis so that with the rotation head within said cradle the cradle is adapted to be pivoted to move the rotation head further back between the mast members to move the rotation head clear of the drill line.

4,393,945

ROTARY DRILL WITH A KELLY BAR AND HYDRAULIC CHUCK

Charles L. Rassieur, Creve Coeur, Mo., assignor to Central Mine Equipment Company, St. Louis, Mo.

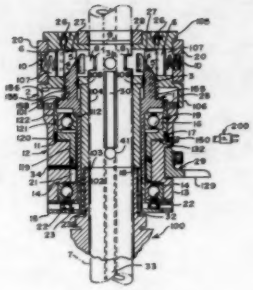
Filed Oct. 22, 1980, Ser. No. 199,429

Int. Cl.³ E21B *3/04*

U.S. Cl. 173—163 **2 Claims**

1. In a rotary drilling apparatus wherein a rotary table is adapted to be moved axially while rotating, said rotary table including a spindle having an axially directed passage through it as its center of rotation, a kelly bar extending through said passage, means carried by the rotary table for transmitting positive rotational force from the rotary table to the kelly bar, said kelly bar having shoulder means having radial shoulder surfaces, elongated plunger means carried by said rotary table for selectively engaging and disengaging said kelly bar shoulder surfaces and actuating means carried by said rotary table for causing said plunger means to engage with and disengage from said shoulder means, the improvement comprising a tubular housing, means for holding said housing against rotation and to permit axial movement of said housing with said

table, a chuck body mounted on said spindle and extending axially within and for rotation with respect to said housing, said plunger means being mounted for radial movement in said chuck body, said plunger means having cam surfaces on opposite sides of them intermediate their ends; said actuating means comprising a tube mounted on said chuck body for axial movement with respect thereto, said tube having spaced fingers, straddling said plunger means, each with a wedge-shaped



camming surface for engaging the said cam surfaces of said plungers and moving said plungers outwardly radially upon axial movement of said tube to disengage said plungers from said kelly bar shoulder means, hydraulic means for moving said tube axially selectively, and means for biasing said plungers toward and into engagement with said kelly bar shoulder means when said tube camming means are moved away from said plungers.

4,393,946

WELL PERFORATING APPARATUS

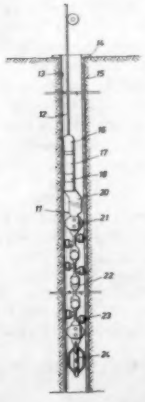
Alain Pottier, Houston, Tex.; Pierre Chesnel, Savigny-sur-Orge, and Bernard Chaintreau, Avon, both of France, assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Aug. 10, 1981, Ser. No. 291,868

Claims priority, application France, Aug. 12, 1980, 80 17723; Feb. 10, 1981, 81 02547

Int. Cl.³ E21B *43/117*

U.S. Cl. 175—4.56 **21 Claims**



1. A well perforating apparatus comprising:

(a) an elongated metallic support tube having successive portions which are crushed edge to edge in different predetermined radial directions to form a series of flat-faced support sections on and offset angularly around said support along the longitudinal direction thereof,

(b) means forming longitudinally spaced attachment holes in said support sections,

(c) explosive charges having sealed cases fixed to the support in the attachments holes,

(d) means on each of said support sections forming said longitudinally spaced attachment holes in pairs with a distance between the centers of each pair smaller than the maximum diameter of a charge perpendicular to its axis, said attachment holes being configured to support the charges with axes substantially perpendicular to said support section flat faces,

(e) rear parts in the charge cases of reduced diameter for engaging in said attachment holes such that two charges are fixed on each of said support sections with the axes of said two charges oriented in opposite radial directions, and

(f) detonating means connected to said charges to fire them.

4,393,947

SOUND ATTENUATING ROCK DRILL SHANK

Uwe Lutze, Munich; Dieter Scholz, Unterpfaffenhofen, and Ernst Brennsteiner, Munich, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Nov. 24, 1981, Ser. No. 324,522

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044775

Int. Cl.³ E21B *17/22*

U.S. Cl. 175—323 **8 Claims**

1. Rock drill comprising an axially elongated drill shank, a boring head at one end of said drill shank, a helix extending around and in the axial direction of said shank for carrying borings away from said boring head, said helix spaced radially outwardly from said shank, an axially extending tubular shell coextensive for the axial length thereof with said drill shank and located between said shank and said helix, means formed of a highly polymerized material for spacing said tubular shell radially outwardly from said drill shank, said helix is supported on said tubular shell, wherein the improvement comprises means located between said helix and said drill shank for providing a sound-attenuating effect and said sound-attenuating means comprises first a support element, located between and in contact with said helix and said tubular shell and serving both as a support for said helix and as a barrier preventing the transmission of vibrations between said helix and said tubular shell.

4,393,948

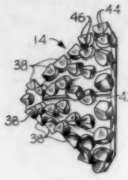
ROCK BORING BIT WITH NOVEL TEETH AND GEOMETRY

Carlos Fernandez, West Covina, Calif., assignor to Boniard I. Brown, West Covina, Calif.

Filed Apr. 1, 1981, Ser. No. 249,814

Int. Cl.³ E21B *10/16*

U.S. Cl. 175—374 **12 Claims**



1. A rock boring bit assembly comprising:

a body adapted for engagement with associated driving components;

at least one cone rotatively mounted on said body, said cone having an axis;

each cone including a plurality of cutting members disposed over substantially all the conical face thereof in generally upstanding relationship to the face, said cutting members having generally rectilinear edges; and

at least some of said cutting members being disposed in a plurality of rings, all of said rings extending around said axis, each of said plurality of rings being axially spaced along said axis and overlapping with at least one other ring and having the cutting members of the respective rings interspersed.

4,393,949

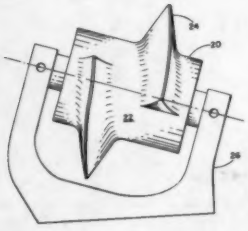
ROCK BORING APPARATUS

Carl R. Peterson, Boxford, Mass., assignor to Peterson Associates, Ltd., Boxford, Mass.

Filed Dec. 29, 1980, Ser. No. 220,906

Int. Cl.³ E21B *10/16*

U.S. Cl. 175—377 **11 Claims**



1. Apparatus for boring holes in rock comprising

a boring head rotatable about an axis of advance, and

a multiplicity of cutters mounted on said head, at least a plurality of said cutters each comprising a helical disc cutter comprising

a cutter body rotatable about a cutter axis, and cutting tooth means forming a helical path about said cutter axis, wherein said path does not close upon itself, the locus of said path upon rotation of said head having a generally conical envelope tapering in the direction of said advance

each said cutter body being mounted on said boring head for free rotation about said cutter axis, whereby each cutting tooth means cuts a substantially circular track about said axis of advance.

4,393,950

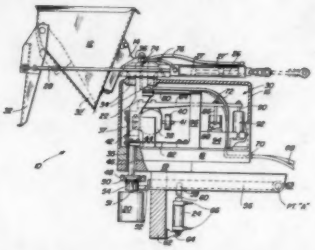
TARE WEIGHING APPARATUS AND METHOD THEREFOR

King L. Klopfenstein, Prospect Heights, and Robert H. Connors, Chicago, both of Ill., assignors to Triangle Package Machinery Company, Chicago, Ill.

Filed Jun. 26, 1981, Ser. No. 277,986

Int. Cl.³ G01G *13/14*

U.S. Cl. 177—108 **16 Claims**



1. A high-speed, particulate material batch weighing apparatus for the cyclic weighing and discharge of individual portions of said material which are of a predetermined, uniform weight and wherein errors caused by changes in the tare weight of said apparatus are compensated for, said apparatus comprising:

a weighing bucket with a discharge gate;

first means for measuring the tare weight of said weighing bucket and discharge gate combination when said discharge gate is open following the discharge of said material therefrom and the stabilization of said tare weight and for generating a first control signal following said measurement;

control means integrally coupled to said discharge gate and to said first means for receiving said first control signal and for closing said discharge gate in response thereto; and

second means for measuring and comparing the weight of the discharge gate, the weighing bucket and material therein with said tare weight and for generating a second control signal when the weight of said discharge gate, weighing bucket and material therein exceeds said tare weight by said predetermined weight, said second means coupled to said control means for providing said second control signal thereto for discharging the material from said weigh bucket in response thereto.

4,393,951

MEASURING DEVICE OF THE USEFUL LOAD AND OF THE LOAD ON THE AXLES OF A TRUCK

Loos Horst-Rudolf, Villars-sur-Glane, and Bernard Dupre, Marly, both of Switzerland, assignors to Vibro-Meter S.A., Fribourg, Switzerland

Filed Nov. 30, 1981, Ser. No. 325,647

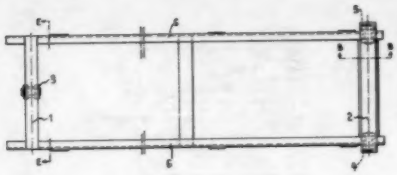
Claims priority, application Switzerland, Dec. 9, 1980, 9066/80

Int. Cl.³ G01G *19/08*

U.S. Cl. 177—136 **12 Claims**

1. Measuring device of the useful load and of the load on the axles of a truck comprising a frame and a tipper, the measurement being effected by load cells mounted between said frame and said tipper, characterized in that the setting and the arrangement of said load cells permits to the tipper a mobility

with respect to the frame with a sufficient number of degress of freedom so that the load cells are submitted exclusively to the



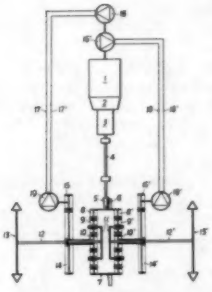
constraints resulting from the weight of said tipper and of said useful load.

4,393,952

STEERING GEAR FOR A TRACK-LAYING VEHICLE

Joachim Schreiner, Gratkorn, Austria, assignor to Bombardier-Rotax Gesellschaft mbH., Vienna, Austria

PCT No. PCT/AT80/00024, § 371 Date Mar. 12, 1981, § 102(e) Date Mar. 10, 1981, PCT Pub. No. WO81/00240, PCT Pub. Date Feb. 5, 1981
PCT Filed Jul. 10, 1980, Ser. No. 242,332
Claims priority, application Austria, Jul. 12, 1979, 4856/79
Int. Cl.³ B62D *11/18*
U.S. Cl. 180—6.44 6 Claims



6. A steering arrangement for a tracklaying vehicle having an engine, a drive shaft, and right and left drive wheels, the steering arrangement comprising:

right and left planetary-gear transmissions each having a sun gear connected to the respective wheel;

a ring gear coaxially surrounding the respective sun gear and connected directly to the drive shaft, the ring gears being joined together for joint rotation;

at least one planet gear meshing with the respective sun and ring gears; and

a planet carrier carrying the respective planet gear;

respective independently operable right and left hydrostatic drive motors connected to the planet carriers of the respective transmissions; and

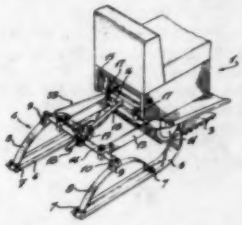
hydrostatic pump means driven by the engine for independently powering and operating the drive motors for adding the rotation of the other inputs to that of the respective outputs.

4,393,953

SNOWMOBILE

Roland Boulianne, 227 de la Fabrique St., Jonquiere, Canada (G7X 3N8)

Filed Jun. 8, 1981, Ser. No. 271,772
Int. Cl.³ B62M *27/02*
U.S. Cl. 180—190 9 Claims



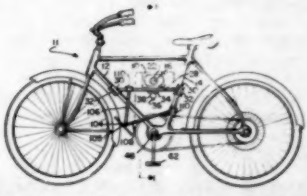
9. A snowmobile comprising a body having a front end and a rear end, a front ski assembly attached to the body and carrying the front end thereof, an endless track attached to the body and carrying the rear end thereof, a rear ski assembly and a suspension arm system pivotally attaching the rear ski assembly and the endless track to the rear end of the body for vertical pivoting displacement of the rear ski assembly and the endless track about a transverse pivot axis relative to each other and to the body, said suspension arm system including a pair of suspension arms longitudinally extending in fore-and-aft direction, and pivotally connecting the endless track and the rear ski assembly relative one to the other, and a resilient suspension pivotally connecting the suspension arms relative to the body for resilient up-and-down displacement of the suspension arms relative to the body.

4,393,954

MOTORIZED BICYCLE

Paul B. Soucy, and John J. Soucy, both of 119 West St., Methuen, Mass. 01844

Filed Apr. 17, 1981, Ser. No. 255,156
Int. Cl.³ B62K *11/00*
U.S. Cl. 180—205 5 Claims



3. In combination with a bicycle having a pedal crank shaft housing, a pedal crank shaft journaled in said housing, a frame having a front diagonal bar, an upwardly extending bar forming a seat support, a rearwardly extending fork, a forwardly extending fork, a wheel carried by said forward fork, a rear wheel carried by said rear fork and a sprocket assembly on the rear wheel, a motor unit attached to said bicycle frame, power input means for transmitting power output from said motor to said pedal crank shaft, a sprocket assembly mounted on said pedal crank shaft, a chain connecting said sprocket assembly with said rear wheel sprocket assembly, and pedal cranks extending from said pedal crank shaft, the improvement comprising means for engaging said pedal cranks to impart movement to said pedal crank shaft and to disengage said pedal crank when power is transmitted from said motor to said pedal

crank shaft and comprising a cam surface disposed on the pedal crank shaft adjacent the ends of said pedal cranks, a slot disposed in said pedal cranks, a movable pin disposed in said slot, a tension spring disposed in said slot for urging said pin into engagement with said cam surface, said cam surface having a portion of its surface arranged to engage said pin during operation of said pedal cranks whereby said pedal cranks transmit movement to said pedal crank shaft.

4,393,955

MOTORBUS OR SIMILAR VEHICLE

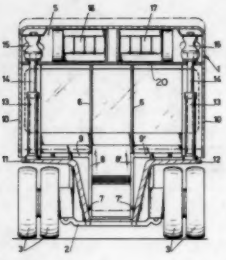
Albert Van Mullem, Boutersem, Belgium, assignor to PVBA Van Mullem, Tienen, Belgium

Continuation of Ser. No. 140,419, Apr. 14, 1980, abandoned. This application Apr. 5, 1982, Ser. No. 365,807

Claims priority, application Belgium, Apr. 12, 1979, 194570

Int. Cl.³ B60K *9/00*

U.S. Cl. 180—291 **6 Claims**



1. A vehicle such as a motor bus having at least a first wheeled support having first wheels adjacent one end thereof and a second wheeled support having second wheels adjacent the other end thereof, said supports including cross members extending between the wheels, a bodywork having a length at least substantially equal to the distance between said wheeled supports, said bodywork defining an upper beam structure, body means suspended from said beam structure and including a lowermost floor with at least a part of the floor at or below the level of the axis of rotation of said wheels, said beam structure defining means for stiffening the bodywork against both transverse and longitudinal bending, and support means for resiliently supporting said beam structure on said wheeled supports, said bodywork defining an upper beam structure, body means suspended from said beam structure and including a lowermost floor with at least a part of the floor at or below the level of the axis of rotation of said wheels, said beam structure defining means for stiffening the bodywork against both transverse and longitudinal bending, and support means for resiliently supporting said beam structure on said wheeled supports, said support means including an upright portion extending upwardly from said wheeled supports and adjacent the side walls of the bodywork, and further including uppermost shock absorbers between said upright portion and said beam structure for providing enhanced stability in the support of the beam structure in its upper disposition.

4,393,956

DRAINING DEVICE USED IN A CAR-MUFFLER

Minoru Tsukui; Hiroshi Sekiguchi, both of Ohta, and Takatoshi Machida, Ashikaga, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

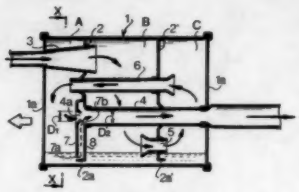
Filed Apr. 7, 1982, Ser. No. 366,442

Claims priority, application Japan, Apr. 8, 1981, 56-50564[U]

Int. Cl.³ F01N *1/08*

U.S. Cl. 181—265 **4 Claims**

1. A draining device used in a car-muffler characterized by comprising a hollow cylindrical muffler body having a plurality of compartments separated by means of partition plates with they having water passing holes disposed to their bottoms, and inlet pipe for exhaust gas communicated to one of the compartments except of that positioned in the front side of the muffler, some intermediary pipes used to communicate the exhaust gas between the compartments, an outlet pipe communicating with the front side compartment, and a water drain path having an inlet port opened to the bottom of the front side



compartment and an outlet port opened to the surrounding portion of the outlet pipe.

4,393,957

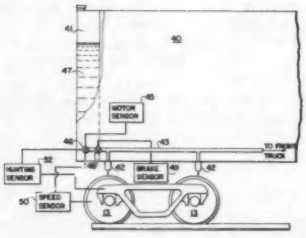
METHOD OF ELIMINATING TRUCK HUNTING IN RAILWAY TRUCKS

V. T. Hawthorne, 310 Danell Rd., Radnor, Pa. 19087

Filed Jan. 27, 1981, Ser. No. 228,976

Int. Cl.³ B61K *3/00*

U.S. Cl. 184—3 R **8 Claims**



1. In the operation of a rail vehicle having trucks with rail contacting wheels and brakes with brake shoes associated with each of said wheels, said rail vehicle being associated with other similar rail vehicles and pulled by a locomotive means, said trucks on each of said pulled rail vehicles tending to vibrate or hunt when pulled by said locomotive means at a speed above a critical speed, a method of eliminating said vibration or hunting to increase the critical speed of said rail vehicle to a value above its operating speed comprised of:

sensing the speed of said vehicle and producing a correlated speed signal;

comparing said speed signal to a fixed reference signal correlated to the critical speed; and

applying a low coefficient of friction material to the wheels of said rail vehicle to provide a lubricating film between said wheels and the rail on which they ride only when said speed signal exceeds said reference signal.

4,393,958

PROGRESSIVE-CENTRAL LUBRICATION SYSTEM

Horst Saretzky, Ennepetal, Fed. Rep. of Germany, assignor to De Limon Fluhme GmbH & Co., Düsseldorf, Fed. Rep. of Germany

Filed Feb. 17, 1981, Ser. No. 235,288

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1980, 3008543

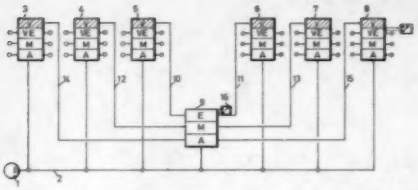
Int. Cl.³ F16N *7/38, 29/00*

U.S. Cl. 184—7 D **11 Claims**

1. In a progressive central lubricating system having at least two progressive distributors connected to a feed line, of which distributors a first so-called master distributor has a plurality of outlets and a second of the progressive distributors has a con-

trol chamber, a control line for connecting one of the outlets of the master distributor to the control chamber of the second of the progressive distributors, said control chamber having no direct connection to the feed line, the improvement comprising

a predetermined additional amount control lines respectively corresponding to the other outlets of the master distributor,



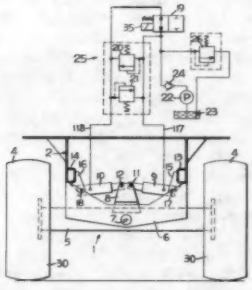
a predetermined amount of other progressive distributors respectively corresponding to the other outlets of the master distributor and having respective corresponding control chambers, the respective corresponding control chambers thereof are each connected by a separate of said additional control lines respectively to the other outlets of the master distributor, and said corresponding control chambers of said other progressive distributors having no direct connection to the feed line.

4,393,959

HYDRAULIC STABILIZER FOR AXLE ON MAST LIFT VEHICLE

Alvin W. Acker, Topeka, Kans., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 10, 1980, Ser. No. 214,642
Int. Cl.³ B66F *17/00*; B60G *21/06*
U.S. Cl. 187—9 E **9 Claims**



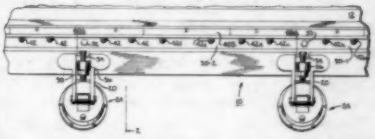
1. A stabilizer on a lift vehicle comprising, a vehicle having a lift mast, a lift carriage reciprocally mounted on said mast for carrying a load, a vehicle chassis, a pivotal axle pivotally supporting said vehicle chassis, a pair of hydraulic cylinders with each cylinder pivotally connected to said axle and to said chassis on opposing sides of said chassis, a hydraulic stabilizer circuit circulating hydraulic fluid in one cylinder and out the other cylinder of said hydraulic cylinders to allow pivoting of said axle, a normally open control valve between said hydraulic cylinders controlling the flow of hydraulic fluid in and out of said hydraulic cylinders, pressure relief valves for cross-over flow between said hydraulic cylinders controlling predetermined stabilizing forces, said control valve closing and interrupting flow in and out of said hydraulic cylinders responsive to the lift of the carriage on said mast lifting above a predetermined height thereby locking said hydraulic cylinders and rigidly fixing said axle with said chassis for stabilizing the support for said vehicle chassis.

4,393,960

LOW NOISE RAILROAD RETARDER BRAKE SHOE STRUCTURE

Michael B. Mazur, and Emil M. Punko, both of Brookfield, Wis., assignors to AAA Sales & Engineering, Inc., Oak Creek, Wis.

Filed Jan. 21, 1981, Ser. No. 226,790
Int. Cl.³ B61K *7/02*
U.S. Cl. 188—62 **17 Claims**



1. A low noise railroad car retarder brake shoe structure suitable for being supported by a plurality of adjacent brake beams arranged in tandem in the retarder for braking the wheel of a railroad car passing through the retarder along a rail, said structure comprising:

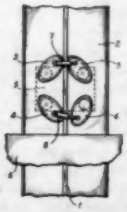
a series of alternating long brake shoes and short brake shoes affixable to the brake beams, the length of a long brake shoe being such that said shoe symmetrically straddles two adjacent brake beams while leaving a space on the brake beam in the central portion thereof, the length of a short brake shoe being such as to occupy the space on the central portion of the brake beam between two long brake shoes; said long brake shoe being affixable to each of the adjacent brake beams at at least two points, said long brake shoes having braking surfaces containing a plurality of slanting slots opening therein, said slots being omitted in the central portion of said long brake shoe, said short brake shoe having a braking surface containing at least one slanting slot opening therein.

4,393,961

DEVICE FOR COUPLING PARTS OF A SELF-RAISING PLATFORM STRUCTURE

Bart Boon, Schiedam, Netherlands, assignor to RSV-Gusto Engineering B.V., Schiedam, Netherlands

PCT No. PCT/NL80/00022, § 371 Date Feb. 18, 1981, § 102(e) Date Feb. 18, 1981, PCT Pub. No. WO80/02853, PCT Pub. Date Dec. 24, 1980
PCT Filed Jun. 17, 1980, Ser. No. 237,148
Int. Cl.³ E02B *17/06*
U.S. Cl. 188—67 **4 Claims**



1. In a self-raising platform structure, a device for coupling together two bodies in any position with respect to each other, said bodies being mounted for linear displacement with respect to each other in two opposite directions, a platform forming one of said bodies and a leg of said platform structure forming

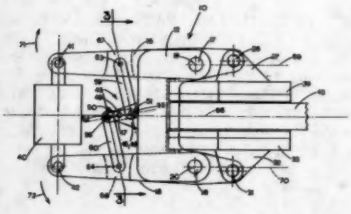
the other body, said device comprising: at least one pair of pawl means, each pawl means having a pawl each pivotally connected at a pivot point to the same one of said bodies and provided with a part capable of contacting the other one of said bodies, said pawl means being arranged at least on both sides of said other body and the pivot points being disposed in a plane extending transversely to the direction of displacement, said contact parts being shaped in such a manner that upon a pivotal movement of the pawl means towards each other said contact parts approach each other, so that the relative movement between the bodies will be inhibited in one of said two directions while being permitted in the other direction, means for pivoting said pair of pawl means towards and apart from each other, and at least a second pair of pawl means connected to said one body and having the same construction as said first pair of pawl means, and being spaced apart from said first pair of pawl means but mounted in such a manner that upon a pivotal movement thereof towards each other the contact parts of the second pair of pawl means will approach each other so that relative movement between the bodies is inhibited in the other direction, and means for pivoting said second pair of pawl means towards and apart from each other.

4,393,962

SELF-CENTERING DEVICE FOR CALIPER BRAKE ASSEMBLY

Jacob Kobelt, 6110 Oak St., Vancouver, British Columbia, Canada (V6M 2W2)

Filed Mar. 5, 1981, Ser. No. 240,906
Int. Cl.³ F16D *55/224*
U.S. Cl. 188—72.6 **10 Claims**



1. A caliper brake assembly having a body and a pair of caliper arms hinged relative to the body for rotation about at least one arm hinge axis, the arms cooperating with brake shoes adjacent inner portions of the arms and an actuator adjacent outer portions of the arms, the assembly being further characterized by:

(a) a rocker means hinged freely to the body for rotation about a rocker axis disposed parallel to the hinge axis,

(b) a pair of rocker links having outer portions thereof hinged to respective caliper arms at equal distances from the respective hinge axis, and inner portions thereof hinged to the rocker means,

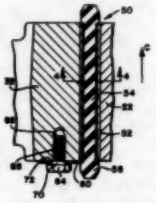
so that movement of one caliper arm is essentially equal and opposite to movement of the remaining caliper arm due to coupling between the caliper arms by the rocker means and rocker links.

4,393,963

DISC BRAKE CALIPER SUPPORT

Roger W. Oltmanns, Jr., South Bend, and Larry A. Portolese, Granger, both of Ind., assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 191,188, Sep. 26, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 412,745
Int. Cl.³ F16D *65/02*
U.S. Cl. 188—73.45 **3 Claims**



1. A disc brake comprising:

a rotor having friction faces on opposite sides thereof and rotatable about an axis perpendicular to the plane of said rotor;

a caliper cooperating with a pair of friction element to urge the pair of friction elements into engagement with the friction faces on the rotor to retard rotation of said rotor;

a non-rotating torque member including a pair of circumferentially-spaced arms which define an opening therebetween, said caliper being received in said opening, said torque member arms having axially-extending grooves in registry with corresponding axially extending grooves in said caliper, said grooves cooperating to define a pair of axially-extending apertures between said torque member arms and said caliper;

a pair of resilient assemblies slidably disposed within said axially-extending apertures between said torque member arms and said caliper, one of said resilient assemblies comprising a split metal sleeve providing a first spring rate responsive to initial distortion of said one resilient assembly in a radial direction up to a predetermined amount, and an elastomeric cylinder providing a second additive spring rate which is higher than said first spring rate, said elastomeric cylinder being responsive to further distortion of said resilient assembly in the radial direction beyond the predetermined amount, said split metal sleeve and said elastomeric cylinder providing for circumferential movement of said caliper relative to said torque member in response to distortion of both said split metal sleeve and said elastomeric cylinder to permit said caliper to abut said torque member, said caliper sliding axially along said resilient assemblies and being substantially restrained from circumferential motion by the arms of said torque member, said second additive spring rate increasingly resisting movement of said caliper into abutment with said torque member to reduce the velocity of movement of said caliper at the time when said caliper abuts said torque member in order to diminish the impact during abutment.

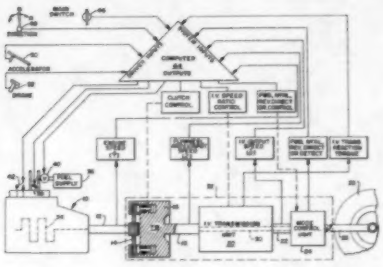
4,393,964
HYBRID POWER SYSTEM AND METHOD FOR OPERATING SAME

Yves J. Kemper, Birmingham, Mich., assignor to Ipanema Company, Bloomfield Hills, Mich.

Continuation of Ser. No. 23,398, Mar. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 938,904, Sep. 1, 1978, abandoned. This application Jan. 28, 1981, Ser. No. 229,056

Int. Cl.³ B60K *41/28*

U.S. Cl. 192—.044 **34 Claims**



1. A hybrid power system for driving an inertial load, said system comprising:

a prime mover having a power shaft and means for converting a succession of power impulses to rotary motion in said power shaft, said means requiring an auxiliary supply of kinetic energy to maintain continuity and smoothness of power shaft rotation during power generating operation of said prime mover;

a flywheel having a kinetic energy storage capacity sufficient to provide said auxiliary supply of kinetic energy;

variable speed transmission for transmitting torque between said flywheel and the inertial load;

adjustable coupling means between said prime mover power shaft and said flywheel, said coupling means being adjustable between a condition of full engagement for driving connection of said power shaft, said flywheel and said transmission means, through an intermediate condition of partial engagement in which said flywheel and said power shaft are yieldably connected for transmission of limited torque, and a condition of complete disengagement to disconnect said flywheel and said power shaft, thereby to provide a range of engagement varying from maximum at said condition of full engagement to minimum at said condition of complete disengagement; and

means for adjusting said coupling means throughout said range of engagement.

4,393,965
ROTARY ACTUATOR

John Zouzoulas, Williamsville, N.Y., assignor to Andco Actuator Products, Inc., Buffalo, N.Y.

Filed Nov. 13, 1980, Ser. No. 206,644

Int. Cl.³ F16D *21/04*

U.S. Cl. 192—48.91 **17 Claims**

1. An actuator comprising:

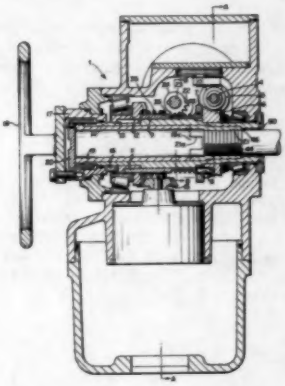
a drive motor;

an output member capable of receiving an output drive rod;

drive means including a worm wheel mounted around said output member and freely rotatable relative thereto, said worm wheel being arranged so as to be rotated by said drive motor, and a driving portion mounted on said worm wheel for transmitting power from said worm wheel to said output member;

coupling means for transmitting rotational movement of said output member to an output drive rod, said coupling means including a driver and a stem nut, said driver and said stem nut being arranged within and coupled to said output member and said stem nut being capable of being attached to an output drive rod to be driven by said actuator;

clutch means mounted on said output member at a location adjacent said drive portion for rotation therewith but being axially movable along said output member, said clutch means having lug members at one end capable of engaging said drive portion and having extension members at its other end coupling said clutch means to said output member so that said clutch means couples said output member to said drive portion of said drive means when said clutch means is arranged in a first position in which said lug members of said clutch means engages said drive portion of said drive means;



bias means for normally biasing said clutch means into its first position;

declutch means capable of causing said clutch means to be moved into a second position so that said lugs are moved out of engagement with said drive portion if rotation of said driving portion ceases;

retaining means for retaining said clutch means in its second position until resumption of rotation of said driving portion, said retaining means including a tripper member that rests upon said driving portion when said clutch means is in its second position; and,

said driving portion including deactivating means for automatically deactivating said declutch means upon resumption of rotation of said driving portion and enabling said clutch means to return to its first position.

4,393,966
OPERATION CONTROL APPARATUS OF A COMPRESSOR

Hiroya Kono; Jun Hasegawa, both of Kariya; Mitsukane Inagaki, Anjo, and Hisao Kobayashi, Kariya, all of Japan, assignors to Toyoda Jidosha Kogyo Kabushiki Kaisha and Nippon Denso Company Limited, both of Aichi, Japan

Filed Oct. 14, 1980, Ser. No. 196,642

Claims priority, application Japan, Oct. 26, 1979, 54-138864

Int. Cl.³ F04B *49/02, 49/06;* **F16D** *43/24*

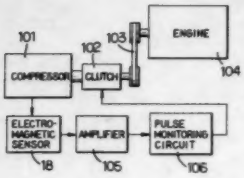
U.S. Cl. 192—56 R **9 Claims**

1. An operation control apparatus of a compressor provided with a rotary shaft which is rotated by a driving apparatus by way of a clutch, and a housing for rotatably supporting said rotary shaft, comprising:

a sensed portion disposed on one end surface of said rotary shaft and offset from the axis of said shaft;

an electromagnetic sensor disposed opposite to a locus described by said sensed portion and generating pulse signals in response to variation of the magnetic flux density which

takes place every time said sensed portion passes across said electromagnetic sensor during rotation of said rotary shaft; and



a pulse monitoring circuit connected to said electromagnetic sensor and providing a release commanding signal to said clutch when it receives no pulse signal from said electromagnetic sensor for a predetermined time duration.

4,393,967

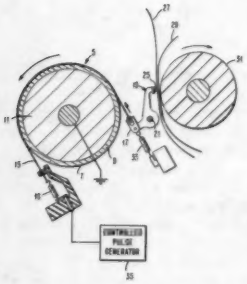
ELECTROSTATIC CLUTCH

Jerome J. Cuomo, Lincolndale; Alfred J. Landon, Peekskill, and Han C. Wang, Yorktown Height, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 91,310, Nov. 5, 1979, abandoned. This application Oct. 21, 1981, Ser. No. 313,717

Int. Cl.³ F16D *27/00*; B65H *29/30*; B05D *5/12*

U.S. Cl. 192—84 E **24 Claims**



1. An electrostatic clutch operable by the Johnsen-Rahbek effect, comprising:

a rotatable drum and a band engageable therewith, said drum including an engageable surface which is a semiconductive surface comprising a layer of substantially pure silicon carbide on a conductive substrate, said layer having a thickness between about 10 μm and 2,500 μm and containing a dopant in an amount effective to cause the resistivity of the layer to be within a range of from about 10^5 to 10^7 ohm-cm.

4,393,968

CLUTCH RELEASE BEARING ASSEMBLIES

Christopher P. Dee, Bishop Tachbrook, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Dec. 18, 1980, Ser. No. 217,808

Claims priority, application United Kingdom, Dec. 22, 1979, 7944327

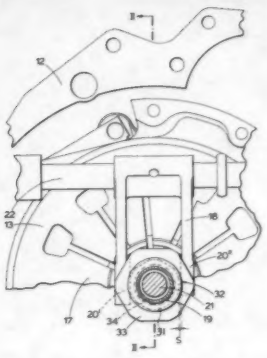
Int. Cl.³ F16D *23/14*

U.S. Cl. 192—98 **4 Claims**

1. An annular release bearing assembly for a pull type friction clutch in which to release the clutch a release fork moves the assembly away from the clutch driven plate along a guide, said assembly comprising;

a bearing having a stationary race;

a co-axial cylindrical stem secured to the stationary race of the bearing and having at least part with a cross-section in the form of a polygon providing pairs of diametrically opposed flats engagable between the fork arms;



and a radial flange secured on the stem providing an abutment against which the fork arms act during release of the clutch, said flange having portions of reduced radial width which are not engageable with the fork arms, and said flange is orientated relative to the stem so that engagement of the fork arms with any pair of opposed flats on the stem automatically cause the stem to rotate on the bearing and align the radially wider portions of the flange with the fork arms.

4,393,969

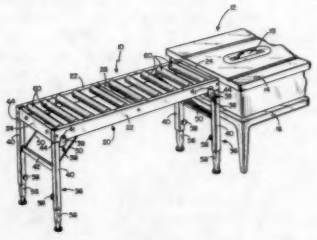
ROLLER TABLE FOR USE WITH A POWER SAW

William J. Woell, R.R. 1, Davenport, N. Dak. 58021

Filed Oct. 27, 1980, Ser. No. 200,777

Int. Cl.³ B65G *13/00*

U.S. Cl. 193—35 TE **6 Claims**



1. For use in combination with a power tool with which large workpieces are used, a self-supporting roller table comprising:

a frame comprising a pair of spaced, parallel, side members and end members joining the side members;

a plurality of support legs at each end of the frame for supporting said frame independently of the power tool at a height compatible for cooperation with said power tool, said legs comprising a pair of leg assemblies at each end of the frame, each leg assembly comprising a pair of legs, each leg comprising a tube section joined to another tube to move as an assembly and having upper and lower ends, said legs each including an adjustable leg portion adjustably telescopically fitted in each tube section;

a plurality of rollers, each roller comprising a plastic pipe section having two open ends and a pair of plastic end plugs having surfaces for respectively concentrically engaging an inside surface of the plastic pipe at both open ends and an integrally molded plastic stub shaft, each side member of the frame having a plurality of apertures formed therein and having annular surfaces for directly receiving the stub shafts of the end plugs to rotatably mount the stub shafts and said rollers in generally parallel spaced apart relationship and directly supported on the annular surfaces; and

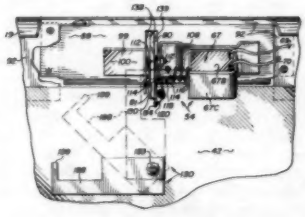
hinge means for pivotally mounting the leg assemblies to the frame side members to position the tubes of each assembly below the lower edge of a respective side member and in alignment therewith, the hinge axis of the hinge means being offset from the longitudinal axis of the legs and above the upper ends of the legs so that when the legs are pivoted upright the upper ends of the tube sections of the legs abut against the lower edge of the respective side frame member to directly support the frame and rollers.

4,393,970

HONOR SYSTEM VENDING MACHINE

Martin P. Strack, Jr., Conway, Ark., assignor to Polyvend Inc., Conway, Ark.

Filed Jul. 31, 1981, Ser. No. 288,897
Int. Cl.³ G07F *11/28*
U.S. Cl. 194—17 **14 Claims**



1. A coin operated vending machine comprising:

housing means adapted to be disposed upon a supporting surface or structure for containing products to be vended;

door means associated with said housing means and adapted to be moved between an open, product accessible position and a closed position;

latching means for releasably maintaining said door means in a closed position, the latching means comprising:

latch bolt means for engaging said door means;

solenoid means for locking said latch bolt means, said solenoid means including plunger means for engaging said latch bolt means, said solenoid means adapted to disengage said plunger means from said latch bolt means thereby unlocking said latch bolt means in response to solenoid energization; and,

shield means for temporarily preventing said plunger means from lockably engaging said latch bolt means after deenergization of said solenoid means to permit subsequent opening of said door means;

coin acceptor means for switching current to said solenoid means in response to the input of preselected coins, whereby to permit opening of said door means to facilitate a vend; and,

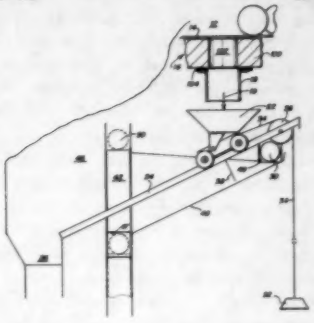
power supply means for supplying current to said coin acceptor means.

4,393,971

COIN-CONTROLLED VENDING APPARATUS

James H. Wilson, 804 W. Mitchell, #410, Arlington, Tex. 76013

Filed Oct. 27, 1980, Ser. No. 200,762
Int. Cl.³ G07F *11/44, 13/02*
U.S. Cl. 194—93 **18 Claims**



7. The method of vending merchandise from a machine in response to the deposit of a prescribed coin using a manually activated slide, comprising the steps of:

(a) utilizing the movement of a manually activated slide to move a ball to a position for engaging a merchandise carrier at a loading station for the carrier, and the ball being lifted with an elevator to a position for engaging the merchandise carrier in response to moving the coin slide within the machine;

(b) utilizing the weight of the ball to operate on the loaded merchandise carrier so as to move said carrier from the loading station to an unloading station;

(c) disengaging the ball from an operative association with the merchandise carrier at the unloading station after the merchandise has been removed from the carrier; and

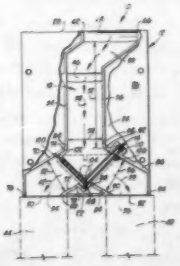
(d) returning the merchandise carrier to the loading station to await the deposit of another coin and the loading of new merchandise.

4,393,972

COIN CHUTE ASSEMBLY

Rex M. Maloy, Broken Arrow, Okla., assignor to Orin W. Coburn, Muskogee, Okla.

Filed Jul. 7, 1980, Ser. No. 166,532
Int. Cl.³ G07D *5/02, 5/08;* G07F *1/04*
U.S. Cl. 194—99 **11 Claims**



1. A coin chute assembly comprising:

a housing having a coin receiving opening, a first coin exit opening, a second coin exit opening, and a coin passageway disposed therein and interconnecting the coin receiving opening with the first and second coin exit openings,

the coin passageway characterized as having an upper coin path, a coin receiving section and a coin reject section, the upper coin path and the coin receiving section being positionable to permit a coin to fall in a substantially downward direction in a mounted position of the coin chute assembly through the upper coin path and the coin receiving section towards the first coin exit opening, and the upper coin path and the coin reject section being positionable to permit a coin to fall in a substantially downward direction in a mounted position of the coin chute assembly through the upper coin path and the coin reject section towards the second coin exit opening;

a gate assembly having a first portion movably disposable in a portion of the coin receiving section and a second portion movably disposable in a portion of the coin reject section, the gate assembly blocking movement of the coin through the coin receiving section of the coin path in one position and directing the coin into the coin reject section of the coin passageway and the gate assembly being movable to one other position for permitting movement of the coin into and through the coin receiving section of the coin passageway and blocking movement of the coin through the coin reject section of the coin passageway; and

wherein the housing comprises a coin receiving end, an opposed second end, a first side and an opposed second side, the first and second sides cooperating to define the coin passageway in the housing, the opposed second side having a first elongated opening extending generally transversely to and intersecting the coin receiving section of the coin passageway, and a second elongated opening extending generally transversely to and intersecting the coin reject section of the coin passageway and wherein the gate assembly is movably disposed in the first and the second elongated openings; and wherein the gate assembly comprises:

a body member having a first side and an opposed second side;

a first gate disposed on the first side of the body member extending from the first side of the body, the first gate being positionable within the first elongated opening in the housing;

a second gate disposed on the first side of the body member and extending from the first side of the body member, the second gate being positionable within the second elongated opening in the housing; and

means for moving the gate assembly in a direction about perpendicular to the coin passageway, comprising:

a pin member having a first end and an opposed second end, the first end of the pin member being secured to the body member of the gate assembly and the pin member extending a distance generally perpendicularly from the body member; and

a solenoid operatively connected to the pin member generally near the second end of the pin member for moving the pin member and the gate assembly connected thereto in a direction about perpendicular to the coin passageway to move the first gate and the second gate in the respective first and second elongated openings in the housing.

4,393,973

METHOD AND APPARATUS FOR REMOVING NON-RECTIFIED CAPSULES FROM A CAPSULE RECTIFICATION AND TRANSPORT DEVICE

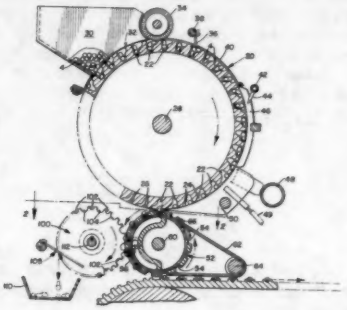
Charles E. Ackley, Sr., Oreland, and Charles E. Ackley, Jr., Philadelphia, both of Pa., assignors to R. W. Hartnett Company, Philadelphia, Pa.

Continuation of Ser. No. 939,066, Sep. 1, 1978, abandoned. This application Jul. 16, 1980, Ser. No. 169,437

The portion of the term of this patent subsequent to Aug. 8, 1995, has been disclaimed.

Int. Cl.³ B65G 47/24

U.S. Cl. 198—384 **7 Claims**



1. Method for removing improperly rectified telescoping capsules from a travelling capsule array, wherein said capsules have body portions and cap portions of enlarged diameter relative to said body portions, slideably telescoping over said body portions, said method comprising:

(a) loading a multiplicity of said capsules into a hopper;

(b) transferring the capsules from the hopper to a rotatable transport cylinder having a plurality of capsule carrying cavities at the surface thereof; said capsules being disposed in random fashion in said cavities, one capsule per cavity, arrangement of said cavities on said transport cylinder defining capsule spacing while within said array;

(c) rectifying substantially all of said capsules in said cavities on said transport cylinder while occasionally appearing non-rectified capsules continue traveling on said transport cylinder;

(d) applying gripping means about all of said capsules, but grasping only said occasionally appearing non-rectified capsules, as said capsules, being substantially rectified, travel in said array; and

(e) removing said non-rectified capsules from said traveling array by exerting force on said non-rectified capsules substantially normal to the direction of travel of said array with said gripping means while removing said gripping means from about said rectified capsules thereby leaving said rectified capsules undisturbed in their previously rectified state while said array is moving.

4. In a capsule rectification and transport device, wherein said capsules are caused to travel from an upstream location to a downstream location and wherein said capsules comprise body portions and enlarged cap portions, the combination comprising, hopper means into which a multiplicity of capsules are to be loaded, an endless conveyor, transport means for receiving said capsules from said hopper and for transporting them in a downstream direction along a predetermined path to said endless conveyor, rectification means disposed adjacent to said transport means for rectifying substantially all of said capsules into dispositions in which said cap portions of said rectified capsules lie along one side of a predetermined path and in which said body portions of said rectified capsules lie on the opposite side of said predetermined path, whereby occasionally appearing non-rectified capsules continue to travel on

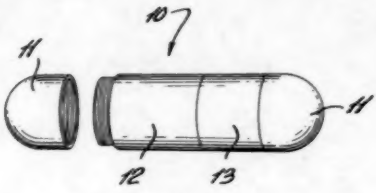
said transport means, and non-rectified capsule removal means located downstream from said rectification means for removing said occasionally appearing non-rectified capsules from said predetermined path, said removal means being positioned adjacent said predetermined path for contacting said non-rectified capsules as they are carried along said predetermined path, and said removal means comprising engagement means physically structured for grasping the non-rectified capsules and being shaped in such a manner so as to grasp only non-rectified capsules while not being capable of grasping rectified capsules, said removal means having capacity for removing said non-rectified capsules from said path, and means provided for removing said non-rectified capsules from said removal means.

4,393,974

WATERPROOF PLASTIC CONTAINER

Michel Levesque, 2091 Montee de la Station, St. Justine de Newton, Canada (J0P 1T0)

Filed Jul. 13, 1981, Ser. No. 284,081
Int. Cl.³ A45C *11/00*; B65D *6/02, 8/04*
U.S. Cl. 206—37 **3 Claims**



1. A watertight utility capsule comprising a pair of tubular opposite end sections each including a closed end and an open screw threaded end, said closed end defining a rounded outer surface, at least one intermediate tubular extension section open at both ends, selectively engageable end to end one with another and with the tubular opposite end sections and cooperatively forming therewith a tubular fully closed container, one end of each intermediate section and the open end of one opposite end section being internally screw threaded, the other end of each intermediate section and open end of the other opposite end section being externally screw threaded complementarily relative to the internally screw threading of said one end and the open end of said one opposite end section, and said tubular sections assembling end to end by screwing the externally screw threaded ends into the internally screw threaded ends respectively, said tubular sections having a constant cross-section and, when assembled, defining a completely smooth external surface, with flush joints at each pair of assembled tubular sections, the constant transverse section of said tubular section being of predetermined size arranged to fit in one user's anus to concealably carry something dry in the user's anus.

4,393,975

REFRIGERATED LIP STICK CONTAINER

Constance R. Moore, 8351 E. Rose La., Scottsdale, Ariz. 85253

Filed Apr. 1, 1982, Ser. No. 364,524
Int. Cl.³ B65D *85/72*
U.S. Cl. 206—385 **6 Claims**

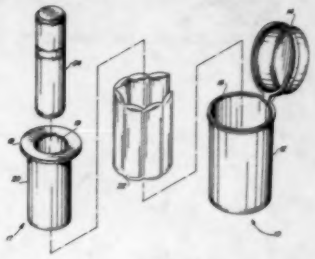
1. An apparatus for retaining and refrigeratng a lip stick dispenser comprising:

(a) a case;

(b) a lip stick dispenser located in said case, said lip stick dispenser having a lipstick located therein;

(c) retainer means for retaining within said case said lip stick dispenser, said retainer means defining a chamber between said case and said lip stick dispenser;

(d) cover means for closing said case to protect said lip stick dispenser; and



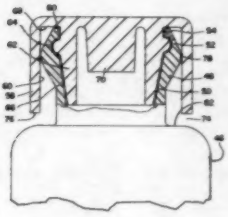
(e) a refrigerant contained within the chamber defined by said retainer means and located around said lip stick dispenser, said case and said cover means enclosing both said refrigerant and said lip stick dispenser together therein.

4,393,976

REUSABLE CHILDPROOF CLOSURE

Daniel J. Maguire, 323 W. Waverly Rd., Glenside, Pa. 19038

Filed Mar. 11, 1982, Ser. No. 356,962
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—211 **12 Claims**



1. In a reusable childproof closure suitable to close the nozzle of a container of the type wherein the nozzle is defined from the container by a shoulder, the improvement which comprises

the nozzle comprising a circular wall having an inside surface and an outside surface,

a peripheral groove extending radially outwardly from the inside surface of the nozzle; and

a cap in overfitting relationship to the nozzle, the cap comprising a top and a hollow, generally cylindrical, closure wall depending from the top,

said closure having an inside surface and an outside surface, the outside surface being of dimension and configuration to slide within and cooperate with the inside surface of the nozzle circular wall,

a peripheral lip extending radially outwardly from the outward surface of the cap closure wall,

the configuration of the nozzle peripheral groove and the configuration of the cap peripheral lip being cooperating and complementing to form a lock therebetween when the cap is applied to the nozzle,

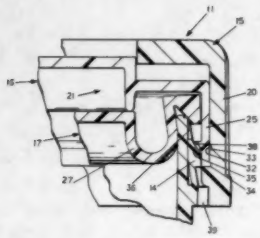
the cap further comprising an outer, generally cylindrical skirt, the said skirt being connected to the said cap closure wall by a radial extension and being configured overfit substantially the entire nozzle,

whereby the cap can be removed from the nozzle by applying upwardly directed forces at the bottom of the said skirt and sufficient magnitude to force the cap lip out of the nozzle groove.

4,393,977
CHILD RESISTANT PACKAGE

Wendell D. Willingham, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 29, 1982, Ser. No. 362,585
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—211 37 Claims



1. A child resistant package comprising

a container having a side wall, a bottom wall and an open end,

a closure including an outer member and an inner member,

said inner member having a portion thereof extending through an opening in the outer member such that axial pressure may be applied through said portion to move the inner member relative to the outer member in an axial direction,

a liner insert sealingly engaging the upper end of the container,

interengaging means between the inner member and the liner such that when the closure is removed from the container, the liner insert is also removed,

spring means between the liner and the inner member yieldingly urging the inner member axially outwardly toward the outer member,

said container having radially resilient portions on the side wall,

said outer member including a peripheral skirt having portions thereof adapted to engage said radial resilient portions on the container,

said inner member having an annular wall adjacent the skirt of the outer member,

said annular wall having means thereon operable upon axial inward movement of said inner member to move said radially movable portions of the container to disengage said portions from the portions of the outer member,

said wall of said inner member and said skirt of said outer member having interengaging portions which engage upon axially inward movement of the inner member relative to the outer member so that the closure can be removed by axial movement carrying with it the outer member, and the inner member and the insert.

4,393,978
REUSABLE CONTAINER CLOSURE CAP

Milton Kessler, Youngstown, and Myron E. Ullman, Jr., Canfield, both of Ohio, assignors to Kessler Products Co., Inc., Youngstown, Ohio

Division of Ser. No. 182,628, Aug. 29, 1980, Pat. No. 4,354,610.
This application Jun. 21, 1982, Ser. No. 390,327
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—253 5 Claims

1. A closure cap for sealing the neck portion of a container such as a milk bottle, the neck portion having an upstanding annular rim, a first outer wall portion depending therefrom and having threads thereon and further having a recess thereon, the closure cap being formed of a material having limited flexibility and comprising:

(a) a disc-like top wall engageable with the rim to effect a substantially fluid-tight seal;

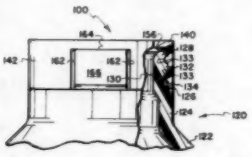
(b) an annular skirt depending from the top wall, the skirt having on its inner periphery:

(i) helical threads configured to mate with the threads on the first outer wall portion of the container neck to secure the closure cap to the bottle, the threads cooperating to form a second substantially, fluid-tight seal;

(ii) a radially inwardly projecting tooth for cooperative reception within the recess of the outer wall portion when the closure cap is fully threaded onto the container, the tooth having a configuration precluding axial vertical movement thereof in response to relative unthreading movement of the cap; and,

(iii) a pair of spaced generally vertically extending rupture zones on either side of the tooth, the rupture zones extending from the lowermost extremity of the skirt to points generally adjacent the closure disc;

(c) a tab projecting laterally outwardly of the skirt from a location near the lower edge thereof, the tab being disposed between the vertically extending rupture zones



whereby, upon upward flexure of the tab, the rupture zones will fail and permit the lower skirt area therebetween to be hinged radially outwardly to withdraw the tooth from the recess and permit unthreading removal of the closure cap from the neck of the container, the limited flexibility of the cap material permitting substantial cooperation of the threads notwithstanding rupture of the skirt wall along the rupture lines, where the cap may thereupon be releasably resecured to the container by the threads with the closure disc effecting the first seal to preclude leakage;

(d) the recess on the outer wall portion of the container neck including an upper wall surface which extends substantially normal to the axis of the container neck; and,

(e) the closure cap tooth including a flat upper surface for reception in said recess against the upper wall surface thereof, the tooth further having a camming surface thereon to permit minimal deflection of said skirt thereon outwardly as said closure cap is threaded onto the container neck portion prior to the reception of the tooth in the recess.

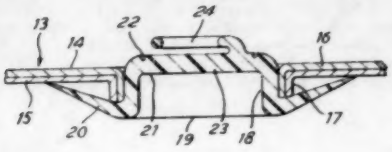
4,393,979
CLOSURES FOR CONTAINERS

Martin F. Ball, Shrivenham, and Fred Fidler, South Morton, Nr. Didcot, both of England, assignors to Metal Box Limited, Reading, England

Filed Apr. 13, 1981, Ser. No. 253,365
Claims priority, application United Kingdom, Apr. 15, 1980, 8012372
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—270 3 Claims

1. A container having a wall, an aperture in the wall, an annulus of gasket material around the aperture on the inside of the container wall and a plug closure including a plug portion, said plug portion including a cylindrical wall and an end wall, said cylindrical wall being disposed in said aperture, said plug closure being constructed from relatively rigid and stiff synthetic copolymeric plastic material, a flange extending generally radially outwardly of the cylindrical wall to surroundingly

underlie an annular wall portion of said container wall, said flange being radially outwardly converging in axial cross-section to thereby define a deformable feather edge, said feather



edge terminating in a terminal edge held in formed sealing engagement with the gasket by frictional engagement of the cylindrical wall in said aperture.

4,393,980

LIQUID CONTAINER ARRANGED TO LIMIT UNDESIRABLE DRAINAGE

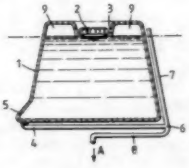
John S. Armour, Farnborough; Peter M. F. Watson, Wokingham, and Graham L. Donne, Bracknell, all of England, assignors to The Minister of Transport in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 28, 1981, Ser. No. 268,030

Claims priority, application United Kingdom, Jun. 17, 1980, 8019788

Int. Cl.³ B65D *25/00*; F16K *45/00*

U.S. Cl. 220—85 S **5 Claims**



1. A liquid tank having a vent arranged to vent the tank when the tank is in a generally upright attitude, a filler arranged to admit liquid into the tank below the upper surface thereof, whereby in use an air space remains in the tank at all times, and a pipe for supplying liquid from the tank, said pipe extending from the base of the tank at a first side thereof and terminating as an open-ended vent in the region of the top of the tank opposite said first side, said pipe including a supply portion extending as a branch from a part of the pipe opposite said first side in the region of the base of the tank.

4,393,981

APPARATUS FOR SUPPLYING A PREDETERMINED NUMBER OF PISTON RINGS TO A WORK STATION

Masahiko Wada, and Masato Ueki, both of Kashiwazaki, Japan, assignors to Kabushiki Kaisha Riken, Tokyo, Japan

Filed May 13, 1981, Ser. No. 263,253

Claims priority, application Japan, May 19, 1980, 55-68417[U]

Int. Cl.³ B65G *59/00*

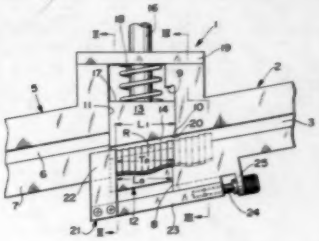
U.S. Cl. 221—289 **5 Claims**

1. Apparatus for supplying a predetermined number of split piston rings to a work station comprising:

(a) a charge-side chute having a pair of downwardly inclined parallel grooves on opposite side surfaces thereof for holding a supply of rings, said grooves receiving the end portions of the confronting end faces forming the gap of the rings whereby the rings are suspended from and slide down the grooves by gravity;

(b) a discharge-side chute having a pair of similarly inclined parallel grooves on opposite side surfaces thereof, said discharge-side chute being spaced from the charge side chute with its grooves extending in a longitudinal direction parallel to but out of alignment with the grooves of the charge-side chute;

(c) slider means for transferring a predetermined number of rings from the charge chute to the discharge chute interposed between the chutes, said means including a slide plate having inclined parallel grooves on opposite side



surfaces thereof, said plate being vertically movable between a position where the grooves of said slide plate are in alignment with the grooves of said charge-side chute to receive rings from the charge chute and a position where the grooves of said slide plate are in alignment with the grooves of said discharge-side chute to transfer the rings from the slide plate to the discharge chute; and

(d) adjuster means for controlling the number of rings received by the slider means and transferred to the discharge chute.

4,393,982

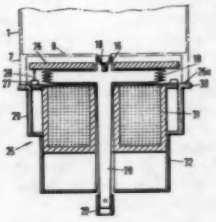
METERED DISPENSING OF LIQUIDS

Alexander Kuckens, Hamburg, Fed. Rep. of Germany, assignor to Dagma Deutsche Automaten und Getrankemaschinen GmbH & Co. KG, Fed. Rep. of Germany

Filed Dec. 17, 1979, Ser. No. 103,904

Int. Cl.³ B65D *83/00*

U.S. Cl. 222—209 **6 Claims**



1. A device for metered dispensing of liquids, especially easily perishable organic liquids, comprising a container in the form of a throw-away package with its outlet opening extending downward in metering position, a metering vessel portion of flexible material communicating with the outlet opening and comprising a tubular member, inlet and outlet openings, and an electromagnetic actuating means for selectively compressing the metering vessel and for actuating closing means at the inlet and outlet of the tubular member, wherein the container is provided with a collar surrounding the outlet opening, in which the metering vessel portion constantly connected to the container can be stored prior to putting the throw-away package into operation, wherein the tubular member of the metering vessel portion is provided with an axially compressible bellows between the closing means, said bellows having a large

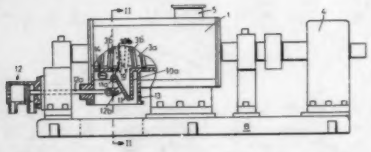
diameter as compared to its axial height, and wherein the area of the tubular member arranged therebelow extends through the central opening of the electromagnetic actuating means provided in the form of an annular coil, and the area arranged above the bellows penetrates an anchor plate radially extending above the bellows.

4,393,983

INTERMESHING SCREW-TYPE REFINER

Erik F. Eriksson, Ymsenvägen 9[1], S-121 42 Johanneshov, Sweden

Continuation of Ser. No. 177,749, Dec. 28, 1979, abandoned.
This application Jul. 24, 1981, Ser. No. 286,644
Claims priority, application United Kingdom, Apr. 28, 1978, 17035/78
Int. Cl.[3] B30B *3/04, 15/32*
U.S. Cl. 222—233 **19 Claims**



1. Apparatus of the type used for treating cellulose pulp, comprising two intermeshing rotary screws driven synchronously within a housing having lateral and end walls and having a material inlet and a material outlet in the range of respectively an inlet and an outlet end of the housing, each screw on a cylindrical core carrying a surface section constituting a treating screw thread, said screw thread comprising a feeding screw thread section starting near said inlet and having a terminal end spaced from said housing outlet end, said cylindrical core further carrying a feed-reversing surface section starting near the terminal end of said feeding screw thread section and having a terminal end near said housing outlet end, said material outlet being provided in the lateral wall of said housing adjacent the terminal end of the feeding screw thread sections of both screws for discharge of treated material substantially at right angles in relation to a plane through the axes of said screws, an outwardly flaring collar outwardly extending from said lateral housing wall around said material outlet, said collar having an outlet opening extending in a plane oblique to the direction of material discharge, means being provided outwardly of said collar selectively to restrict the outlet area of said collar outlet opening, said restricting means comprising a closure element moveable between a position in which said oblique collar outlet opening is substantially closed and opening positions in which said oblique collar outlet opening is selectively uncovered, adjustable means being provided controlling the movement of said closure element to selectively establish the resistance offered by said restricting means against discharge of material through said outlet.

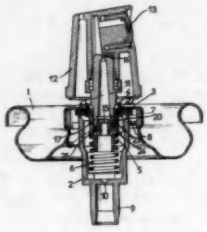
4,393,984

VAPOR TAP VALVE FOR AEROSOLS

Andre Debard, Buc., France, assignor to Aerosol Inventions and Development AS AID SA, Fribourg, Switzerland

Filed Sep. 12, 1980, Ser. No. 186,661
Claims priority, application France, Sep. 20, 1979, 79 23394
Int. Cl.[3] B65D *83/14*
U.S. Cl. 222—402.18 **5 Claims**

1. A vapour tap valve for aerosol packages comprising a mounting cup for crimping onto a container containing liquid and gas, said mounting cup carrying a valve shell held clamped against an annular sealing gasket centred on an axial opening in said mounting cup, said valve shell enclosing and guiding axially a spring-loaded valve member with a spring urging said valve member into sealing engagement with said gasket, said shell having in the immediate neighbourhood of said gasket at least one passage for admitting additional gas from said container into said shell and having, at the opposite end from said gasket, a liquid inlet tube, said valve member being axially extended by a hollow actuating and dispensing stem for said valve for dispensing a mixture of said liquid and gas, and said stem passing in a sealing manner through said gasket; said valve being characterised in that said actuating stem and said valve member define between them a plurality of passages



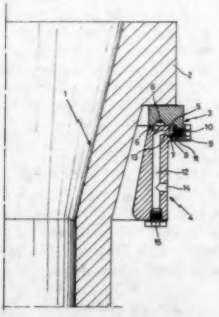
closable by said gasket and effective, when opened, to conduct a flow of mixed liquid and additional gas from the interior of said shell to the interior of said actuating stem, wherein said valve member has, facing the gasket, a cylindrical axial recess of polygonal section in which is secured the hollow actuating stem in the form of a cylinder of revolution which opens freely to the base of said recess, forming at least five circumferentially spaced passages capable of being closed off by said gasket and of providing communication between the interior of said shell and said hollow actuating stem.

4,393,985

LADLE SHROUD SUPPORT ASSEMBLY

Rudi Müller, Bad Oeynhausen, and Wolfgang Löser, Wesel-Flüren, both of Fed. Rep. of Germany, assignors to Vesuvius International Corporation, Wilmington, Del.

Filed Feb. 11, 1981, Ser. No. 233,367
Claims priority, application United Kingdom, Mar. 7, 1980, 8007825
Int. Cl.[3] B22D *41/08*
U.S. Cl. 222—591 **10 Claims**



4. An assembly for supporting a ladle protection shroud cooperable with a movable plate of a rotary slide gate mechanism of a metal pour vessel for protecting the pouring of molten metal into a mould, comprising: a flange (2) extending outwardly from a ladle protection shroud (1), a shroud holding ring (4), an intermediate bearing ring (3) disposed between the flange and the holding ring and configured to define a planar annular sliding surface (5) with the holding ring to enable free rotational motion of the shroud and bearing ring about the

holding ring and interlocking means for slidably coupling the bearing ring to the holding ring and for preventing relative axial motion between said rings.

4,393,986

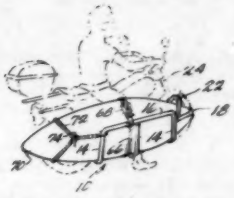
SURFBOARD CARRYING RACK

Michael Sirey, 555 Banyan Tree La. #201, Delray Beach, Fla. 33444

Filed Jun. 4, 1982, Ser. No. 385,258

Int. Cl.³ B62J *9/00, 11/00, 7/02*

U.S. Cl. 224—32 A **16 Claims**



1. A rack for carrying a surfboard on edge longitudinally on a two-wheeled vehicle comprising:

longitudinally extending frame means having a U-shaped end view transverse to the longitudinal extent of said frame means for receiving said surfboard;

means for attaching said frame means to a side of said vehicle;

a first U-shaped restraining member having two legs connected by a bight portion, said legs extending from an end of said frame means so that said bight portion extends transverse to said longitudinal extent of said frame means;

a second U-shaped restraining member having two legs connected by a bight portion, said legs of said second restraining member extending generally upwardly from adjacent said first restraining member so that the respective bight portions of the first and second restraining members function to prevent said surfboard from sliding forward with respect to said vehicle;

means for preventing said surfboard from moving upward out of said frame means; and

means for preventing said surfboard from moving rearwardly with respect to said vehicle out of said frame means.

4,393,987

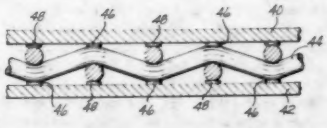
SUPERPLASTICALLY FORMED STRUCTURE AND METHOD OF MAKING

Charles N. Anderson, Kent; Samuel D. Elrod, Seattle, and Gerald O. Miller, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1981, Ser. No. 307,039

Int. Cl.³ B23K *31/02*

U.S. Cl. 228—157 **13 Claims**



1. A method of superplastically forming a reinforced panel, with steps comprising: placing a grid patterned core material onto a titanium sheet, locating an aluminum shim between the core and the sheet at alternate grid intersections, spot welding the core to the sheet at each intersection not having an aluminum shim, placing a titanium sheet over the core and spot welding them together at each grid intersection having an aluminum spacer, raising the temperature into superplastic forming range and introducing an inert gas under pressure between the sheets moving the sheets apart and forming a panel reinforced with the core material joined at alternate intersections to opposite face sheets.

4,393,988

SPOON LID

Mary Burke, 2430 Fair Oaks Apt. 187, Sacramento, Calif. 95825

Filed Jul. 15, 1981, Ser. No. 283,444

Int. Cl.³ B65D *43/08, 3/00*

U.S. Cl. 229—43 **7 Claims**

1. A deformable container-lid including a spoon integral therewith comprising in combination:

a lid having substantially planar top and bottom surfaces and a depending perimeter lip adapted to sealingly engage a container,

a tab member formed to serve as an eating utensil folded by a hinge on said bottom surface of said lid inboard of said lip whereby said utensil is adapted to be folded from a stored position parallel to and underlying said bottom lid surface to a hinged outwardly deployed position extending beyond said lip, said tab member having crease and score lines thereon to assist deformation,

said lid and hinge formed from a resilient material having a memory whereby said lid and hinge can be respectively deformed and deployed to dispense material within said container with said utensil, and thereafter restored to an original condition for storage of a portion of the material in the container.

4,393,989

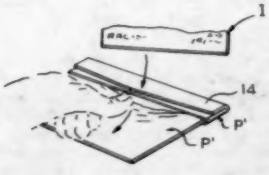
ENVELOPE-TYPE MAILING FOLDER

Greg P. Maclin, and Allen M. Brandenburger, both of Stone Mountain, Ga., assignors to Container Corporation of America, Chicago, Ill.

Filed Jul. 30, 1981, Ser. No. 288,350

Int. Cl.³ B65D *27/04, 27/08;* **G09F** *3/18*

U.S. Cl. 229—71 **1 Claim**



1. In an envelope-type mailing folder formed from a unitary blank of foldable paperboard, the combination of:

(a) a rear panel;

(b) a pair of end panels foldably joined to opposite ends of said rear panel and folded to overlie marginal end portions of said rear panel;

(c) a front panel foldably joined along one side edge to a side edge of said rear panel;

(d) said front panel overlying said rear panel and said end panels and being secured to the latter to form with both said rear panel and said end panels an internal, primary pocket for receiving material to be transported in said folder;

(e) a closure flap foldably joined to another side edge of said front panel and being folded to overlie and be secured to said rear panel to close said primary pocket;

(f) a transparent, plastic film having marginal areas secured to a portion of said front panel, said end panels and an outer surface of said rear panel extending the entire length thereof to form with said rear panel a separate, external secondary pocket for receiving and displaying other material, said plastic film including a pair of sheets having adjacent marginal areas disposed in overlapped relation to provide access to said secondary pocket.

4,393,990

PROCESS AND DEVICE FOR DISPERSING FLAMMABLE GASES INTO THE ATMOSPHERE

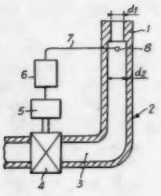
Flavien Lazarre, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Dec. 2, 1980, Ser. No. 212,114

Claims priority, application France, Dec. 7, 1979, 79 30069

Int. Cl.³ F23D *13/20*

U.S. Cl. 239—1 **3 Claims**



1. A process for dispersing flammable gas into the atmosphere without danger of explosion or combustion comprising, ejecting the gas through at least one opening of specified area, at a pressure above a minimum pressure, and below a maximum pressure, said minimum pressure corresponding to a pressure below which said gas flowing through said opening is explosive, and said maximum pressure corresponding to a pressure above which said gas flowing through said opening exhibits stable ignition in the presence of a flame.

4,393,991

SONIC WATER JET NOZZLE

Nathaniel B. Jeffras, Woodland Hills, and Robert H. Torgersen, Canoga Park, both of Calif., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed May 29, 1981, Ser. No. 268,286

Int. Cl.³ B05B *17/06*

U.S. Cl. 239—102 **10 Claims**

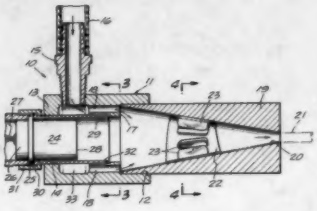
1. A sonic water jet nozzle, comprising:

a housing including a chamber for containing a source of sonic energy, and walls defining a plurality of substantially parallel passages lying outwardly of the first chamber, one end of each passage being in open communication with said chamber in said housing and the other end of each passage opening to the exterior of said housing;

means for interconnecting the other ends of the passage at the housing exterior to a source of pressurized fluid;

a nozzle body having a conical passage therethrough with a relatively large opening at one surface and a relatively small opening at another surface, the centerline of said conical passage being substantially parallel to said plurality of passages;

said nozzle body being interconnected with the housing such that the large opening communicates with the chamber and the plurality of passages; and



radially extending finlike means received within said conical passage for retarding rotation of water passing through the nozzle body conical passage.

4,393,992

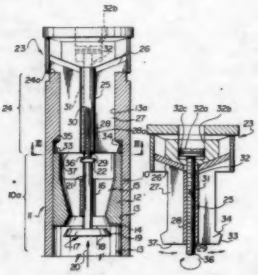
SPRINKLER HEAD ASSEMBLY

Norman E. Strunk, 401 McMaster Crescent, Saskatoon, Saskatchewan, and Anton P. Pohoreski, Box 100, Asquith, Saskatchewan, both of Canada

Filed Apr. 28, 1981, Ser. No. 258,311

Int. Cl.³ B05B *15/06*

U.S. Cl. 239—200 **7 Claims**



1. A sprinkler head assembly including a hollow sprinkler head assembly tube, a sprinkler tip secured within the upper portion of said hollow sprinkler head assembly tube, and a valve secured within the lower portion of said hollow sprinkler head assembly tube, comprising

(I) means for retaining said sprinkler tip within said hollow sprinkler head assembly tube, comprising:

(i) first securing means associated with said hollow sprinkler head assembly tube;

(ii) second securing means depending from said sprinkler tip for insertion into the upper portion of said hollow sprinkler head assembly tube, said second securing means comprising a pair of diametrically opposite wings, the lower portions of which are normally biased towards one another, a central longitudinally extending tube bifurcated at its lower end interconnecting said wings, an upwardly facing shoulder at the lower portion of each said wings, and means associated with said bifurcated central tube for urging said abutment shoulders apart into secure engagement with said retaining means, said means including a rod disposed within said bifurcated tube, said rod being of slightly greater diameter than said threaded bore; whereby downward longitudinal movement of said rod urges said abutment shoulders apart into secure engagement with said retaining means;

(iii) retaining means within the upper portion of said hol-

low sprinkler head assembly tube on the inner wall thereof; and

(iv) means for urging said securing means into secure engagement with said retaining means, said means comprising said fiburcated tube and said rod; and

(II) a valve assembly comprising a valve seat secured within said hollow sprinkler head assembly tube, a valve engageable with said seat, said valve including a head and a stem extending therefrom, said stem being provided with a head, means in said valve assembly to support and guide said valve for reciprocal motion relative to said seat, said valve stem being normally in a lower position with the valve in its fully opened position, and means to control the vertical position of said valve relative to said seat, said control means comprising said rod for said securing means into secure engagement with said retaining means whereby, when said rod urges said abutment shoulders apart into secure engagement with said retaining means, said rod also engages said stem head, thereby to limit upward movement of said valve stem.

4,393,993

SPRAY GUN

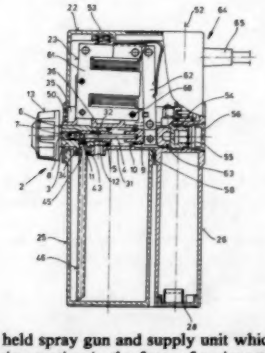
Ewald Kille, and Guido Zimmermann, both of Friedrichshafen, Fed. Rep. of Germany, assignors to J. Wagner GmbH, Fed. Rep. of Germany

Filed May 27, 1981, Ser. No. 267,666

Claims priority, application Fed. Rep. of Germany, May 30, 1980, 3020539

Int. Cl.³ B05B *9/04*

U.S. Cl. 239—332 **14 Claims**



1. A hand held spray gun and supply unit which comprises a center housing section in the form of an inverted L-shaped member having a horizontal top leg with top and bottom faces and a peripheral side wall, said top leg having a front to rear longitudinally extending bore and a vertical hollow hand grip leg depending from the rear portion of the horizontal leg with a fragmental cylindrical recessed front face along the length thereof under the horizontal leg, a pump assembly removably mounted in said bore including a pump cylinder in said bore and a nozzle overlying the peripheral side wall of the horizontal leg at the front of the bore communicating with said cylinder, said cylinder having an intake extending through the bottom face of said horizontal leg, a piston reciprocally mounted in said cylinder to pump fluid from the intake through the nozzle, a cylindrical supply container removably suspended from the bottom face of said horizontal leg embraced by the vertical leg in the recessed front face thereof, an electric motor mounted on the top face of said horizontal leg driving said piston, said hollow vertical leg providing a chamber adapted to receive a battery to energize said motor, a switch on the top face of said horizontal leg having an actuating button accessible at the peripheral side wall of said horizontal leg, a removable cover on said horizontal leg enclosing said motor and switch, and a tube depending from the bottom face of the horizontal leg into the container for supplying fluid from the bottom of the container to said intake for discharge through said nozzle.

4,393,994

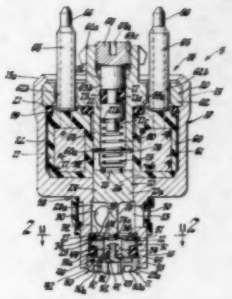
ELECTROMAGNETIC FUEL INJECTOR WITH FLEXIBLE DISC VALVE

Gerald C. Rieck, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 6, 1981, Ser. No. 251,466

Int. Cl.³ B05B *1/30*

U.S. Cl. 239—585 **3 Claims**



1. An electromagnetic fuel injector including housing means providing a fuel chamber therein intermediate its ends adapted to receive fuel and which has an upstanding annular valve seat therein encircling a discharge passage from said chamber through which fuel is to be ejected; a flexed flexible valve means having spaced apart fingers positioned in said fuel chamber and adapted to be vertically flexed relative to said valve seat to open and close said passage; a solenoid means operatively supported in said housing means, said solenoid means including an axial movable armature positioned to engage one side of said valve means opposite said valve seat and, a valve-closing spring positioned to act on said armature in an axial direction whereby said valve means is forced by said armature into seating engagement with said valve seat; and, a valve-opening spring disposed in said discharge passage and positioned to abut against the opposite side of said valve means to effect unseating of said valve means from said valve seat when said solenoid means is energized.

4,393,995

EMERGENCY LOCKING TYPE RETRACTOR

Masahiro Tukamoto, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1982, Ser. No. 369,004

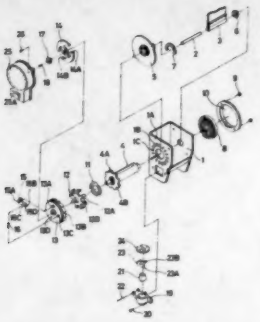
Claims priority, application Japan, Apr. 25, 1981, 56-59213[U]

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 A **5 Claims**

1. An emergency locking type retractor having a retractor base; a take-up reel to which webbing is fastened and which is rotatably supported by said retractor base while being biased in webbing take-up direction; locking means formed around the portion of said retractor base which supports said take-up reel; a latch member supported by said take-up reel for axial sliding movement between a position in which it is engaged with said locking means and a non-engaging position in which it is not engaged with said locking means, said latch member having an engaging portion and a cam portion; a guide member rotatable with said take-up reel and having a guide portion normally engaged with the engaging portion of said latch member and

guiding the movement thereof in the axial direction of said take-up reel; a biasing member for biasing said latch member toward said non-engaging position; a ratchet wheel having a toothed portion and a cam portion engaged with the cam portion of said latch member, said ratchet wheel being loosely fitted on said take-up reel against axial movement; a first latch piece mounted on said ratchet wheel for movement between a first position and a second position and biased toward said first position; an inertia member loosely fitted on said take-up reel for operating said first latch piece; a latch portion secured to said retractor base and engageable with said first latch piece when said latch piece is brought from said first position to said second position by said inertia member rotating relative to said ratchet wheel upon sensing of a webbing draw-out speed ex-



ceeding a predetermined value, thereby stopping rotation of said ratchet wheel; and a vehicle sensing mechanism provided on said retractor base, said vehicle sensing mechanism including a second latch piece and means for sensing a vehicle acceleration or deceleration exceeding a predetermined value to thereby bring said second latch piece from a non-engaging position in which it is not engaged with the toothed portion of said ratchet wheel to a position in which it is engaged with said toothed portion, thereby stopping rotation of said ratchet wheel; whereby when rotation of said ratchet wheel is stopped, said latch member is caused to slide axially by the cam portion of said ratchet wheel through the cam portion of said latch member and is brought to a position in which it is engaged with said locking means, so that the rotation of said take-up reel in webbing draw-out direction is locked.

4,393,996

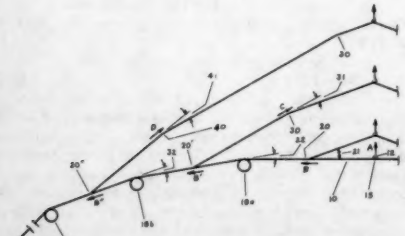
AIRCRAFT ARRESTMENT SYSTEM

Cazimir Tuman, 71 Caleta Dr., Camarillo, Calif. 93010

Continuation-in-part of Ser. No. 170,692, Jul. 21, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 348,739

Int. Cl.³ B64F *1/02*

U.S. Cl. 244—110 C **12 Claims**



1. An arrestment system having constraining means placed across an arrestment area for engagement with a moving body, said engagement causing the formation of transverse waves in the constraining means, including tensile-load absorption means at opposing ends of the constraining means; wherein the improvement comprises:

stationary guide means positioned against opposing flexible linear portions of said constraining means at the side thereof opposite the direction of said moving body and longitudinally offset from the moving body engagement point;

said guide means imparting a curved shape having a diminishing radius of curvature to said portions whereby less than total reflection of the transverse waves occurs at the point where said guide means contact the flexible linear portions of said constraining means.

4,393,997

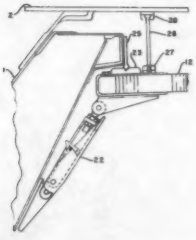
REMOVABLE SECONDARY AIRCRAFT FUEL ENCLOSURE

David L. Gibler, Rancho Palos Verdes, and Daniel J. O'Connell, Cypress, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 15, 1982, Ser. No. 368,785

Int. Cl.³ B64D *37/32*

U.S. Cl. 244—135 R **3 Claims**



1. A removable enclosure for sealing an aircraft fuel tank against fuel leakage into aircraft fuselage compartments, comprising:

a. a drip pan disposed beneath said tank within said fuselage, said pan defining a shallow trough for collecting liquid from said tank;

b. a peripheral seal on the surface of said pan;

c. means defining a drain line, communicating with said trough, for draining said liquid accumulations overboard said aircraft;

d. first and second upright panels, attached to said aircraft, at respective opposite ends of said pan; and

e. means for releasably sealing said ends of said pan to said upright panels and the sides of said pan to said fuselage at said peripheral seal, said means including a plurality of overcenter fasteners spaced around the periphery of said pan releasably interconnecting said pan with said aircraft and said upright panels.

4,393,998

TUBE CLAMP

Walter E. Allen, Prospect, Conn., and Douglas D. Wilson, Huntington, W. Va., assignors to Transamerica DeLaval Inc., Princeton, N.J.

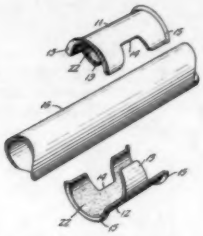
Filed Jul. 20, 1981, Ser. No. 285,401

Int. Cl.³ F16L *3/08*

U.S. Cl. 248—74 R **4 Claims**

1. In clamping apparatus for supporting a metal tube from fixed structure, wherein (a) a split metal sleeve with raised end shoulders comprises identical interlocking halves of greater

than 180° total extent such that each half has self-retaining snap-action assembly capability in respect of the same metal tube, and wherein (b) a fixedly mountable loop clamp surrounds the sleeve with axial play between the end shoulders, the loop clamping being so sized when clamped to said sleeve as to establish a predetermined frictional resistance to sleeve displacement with respect to said clamp, the improvement wherein each of the sleeve halves has a thin layer of friction material bonded thereto, said friction material comprising an uncured nitrite rubber-phenolic resin adhesive which incorporates its curing agents, the bore of the lined sleeve halves being compressed in engagement with the metal tube such that the frictional resistance to displacement of the sleeve on the metal tube is greater than the frictional resistance to sleeve displacement with respect to said clamp, said adhesive being curable to establish a bond of said sleeve to said metal tube in the presence of minimum ambient temperature in the order of 300° F., whereby in aircraft application in the vicinity of an engine with ambient temperatures of at least 300° F., where displacement accommodation of the sleeve on a metal tube is not desirable, said sleeve will become bonded to the metal tube upon operation of the engine; and further whereby in aircraft application in wing or the like structure which is subject to flexure and which is characterized by lesser ambient temperatures, said sleeve will not become bonded to the metal tube but rather will remain capable of displacement on the metal tube for such unusual situations of axial play as the clamp-to-sleeve engagement will not accommodate.

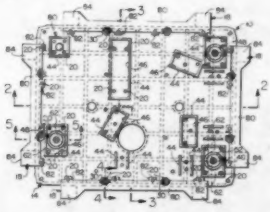


4,393,999

CONVEYOR PALLET CONSTRUCTION

David J. Forshee, Oxford, Mich., assignor to Syn-Trac Systems Inc., Oxford, Mich.

Filed Dec. 29, 1980, Ser. No. 220,798
Int. Cl.³ B65D *19/32, 19/44*
U.S. Cl. 248—346 **41 Claims**



1. In a conveyor driven plastic pallet structure for supporting and translating a device to be processed, assembled and/or tested, the improved combination comprising

a top plate, an intermediate grid body and a bottom plate arranged in lamella relationship,

said grid body having a plurality of spaced apart intermediate grid members defining open pockets or spaces therebetween and lateral side members defining the perimeter of said grid body,

one or more upstanding fixture devices secured to and upon the upper surface of said top plate for selective engagement and attachment by and to, and disengagement and detachment from a processing, assembling and/or testing machine, and for elevating and lowering said pallet for one or more processing, assembling and/or testing operations on said device supported on and translated by said pallet,

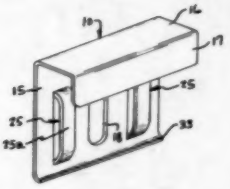
and means fixedly securing said fixture devices to said top plate surface, and securing said top plate, grid body and bottom plate together.

4,394,000

METAL MIRROR MOUNTING CLIP

Thomas D. Kurtz, 1101 First Ave., Rock Falls, Ill. 61071

Filed Jan. 2, 1981, Ser. No. 222,122
Int. Cl.³ A47G *1/16*
U.S. Cl. 248—466 **4 Claims**



1. A metal mirror mounting clip comprising, a back plate having an integral flange on one edge extending forwardly from the front side of the back plate and an integral lip on the flange spaced forwardly from the forward side of the back plate, a mounting screw having a head and a threaded shank, the back plate having an elongated slot extending perpendicular to the flange for receiving the shank of the headed mounting screw, the back plate having a pair of mirror guide shoes integral therewith generally paralleling the slot and spaced from opposite sides of the slot, said mirror guide shoes each comprising an elongated strip sheared along its lengthwise edges from the back plate and having an elongated generally straight portion offset forwardly from the front side of the back plate and rearwardly curved end portions at opposite ends of the straight portion integral with the back plate, the guide shoes defining guide surfaces spaced forwardly from the front side of the back plate a distance greater than the height of the head of the mounting screw.

4,394,001

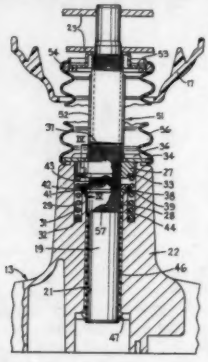
HEIGHT-ADJUSTING MECHANISM FOR CHAIR SEAT

Joseph M. Wisniewski, Marne, Mich., assignor to Haworth, Inc., Holland, Mich.

Filed Mar. 18, 1981, Ser. No. 244,841
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—542 **10 Claims**

1. In a chair having a seat means, a base having thereon an upwardly-projecting pedestal defining a central opening which projects vertically downwardly therethrough, a vertically-elongated spindle having the upper end portion thereof nonrotatably secured to said seat means, said spindle projecting downwardly so that the lower portion thereof is rotatably positioned and confined within said central opening, said spindle having an elongated central portion thereof provided with external threads, and a load-released height-adjusting mechanism coacting between said spindle and said pedestal for (1) rotatably supporting the seat means when occupied for rotation about the axis of the spindle and (2) permitting the height of said seat means when unoccupied to be vertically adjusted

responsive to rotation of the unoccupied seat means relative to the base, said height-adjusting means including a nut threadably engaged with said spindle, a first clutch means for nonrotatably connecting said nut to said spindle when said seat means is occupied, a second clutch means for nonrotatably connecting said nut to said pedestal when said seat means is unoccupied, and spring means normally urging said nut upwardly relative to said pedestal for effecting engagement of said second clutch means when the seat means is unoccupied, the improvement comprising: an enlarged bore formed in said pedestal and projecting downwardly from the upper end thereof in concentric relationship to said central opening, said second clutch means being mounted adjacent the upper end of said pedestal, said first clutch means being positioned within said bore downwardly a substantial distance below said second clutch means, said nut being disposed vertically between said first and second clutch means, said second clutch means includinng a second clutch element fixed to said pedestal adjacent the upper end thereof and disposed for engagement with



an opposed upper clutch portion formed on the upper end of said nut when said nut is in a raised position due to said seat means being unoccupied, said first clutch means including a first clutch element which is axially seated on a shoulder formed on said pedestal in axially downwardly spaced relationship from the upper end of said pedestal, said first clutch element being nonrotatably but axially slidably connected to said spindle and being engageable with an opposed lower clutch portion formed on the lower end of said nut when the latter is in its lower position due to said seat means being occupied, and said spring means comprising a coil spring concentrically disposed within said bore and having the lower end thereof seated on said pedestal and the upper end thereof disposed in operative engagement with said nut for continuously urging the latter upwardly toward said second clutch element, said coil spring being disposed in encircling relationship to said first clutch element, whereby said nut is totally disengaged and is spaced axially upwardly from said first clutch element when in said upper position.

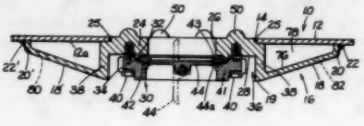
4,394,002

MOUNTING FLANGE FOR WAFERSPHERE BOTTOM OUTLET VALVE

Richard B. Polley, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Apr. 6, 1981, Ser. No. 251,407
Int. Cl.³ B61D *5/00*
U.S. Cl. 251—144 **15 Claims**

1. A railway tank car valve assembly comprising: a tank bottom having a tank opening therein; a mounting flange mounted adjacent said tank opening; said mounting flange having a tapered portion extending longitudinally on either side of said lading opening; said mounting flange further including a flange body portion located inwardly from said tapered portion having a flange opening for lading to pass through for entry or exit from the tank; said body portion further including a recess located below the body portion adapted to receive a valve housing having a valve seat and a lading valve located within the housing; first fastener means holding said housing in place within said mounting flange; shaft means to move said valve between open and closed posi-



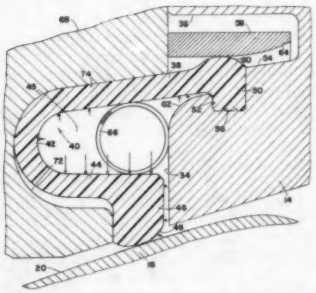
tions relative to said valve seat extending out of the valve housing, and wedge means extending longitudinally of said mounting flange and located between and engaging both said valve housing and said mounting flange adjacent said shaft means effective to carry impact load components applied through said valve housing to said mounting flange; and thereby protect said shaft means.

4,394,003

CRYOGENIC BUTTERFLY VALVE WITH BI-DIRECTIONAL SEALING CAPABILITY

Ritchie W. Whitaker, El Toro, Calif., assignor to The Walworth Company, Valley Forge, Del.

Filed Nov. 16, 1981, Ser. No. 321,591
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—173 **8 Claims**



1. In a valve comprising:
a valve body having a flow passage therethrough;
a valve disc rotatably mounted in said body between valve open and valve closed positions;
an annular sealing surface around the periphery of said valve disc; and
an annular sealing device on said body surrounding said sealing surface;
said sealing device comprising:
an annular relatively wide recess having a relatively narrow opening therefrom;
a resilient seal ring in said recess;
said seal ring being of generally reclining-U configuration, with legs transverse to the axis of rotation of said disc;
the radially outer leg being longer than the inner leg so that pressure acting against the outer surface of said seal ring will bias same radially inward;
means clamping and sealing the annular edge of said outer leg in said body; and
a radially extending, dynamic seal inward extension on the

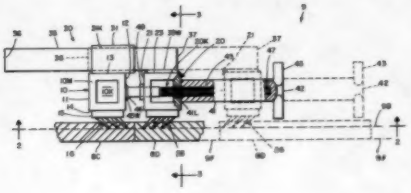
end of said inner leg extending through said narrow opening into sealing engagement with said disc.

4,394,004

CARPET STRETCHING TOOL

James R. Allen, 3130 S. 17th St., Omaha, Nebr. 68108; John D. Allen, 10302 S. 144th St., Omaha, Nebr. 68138, and Robert A. Knigge, 11808 Cryer Ave., Omaha, Nebr. 68144

Filed May 22, 1981, Ser. No. 266,488
Int. Cl.³ B65H *77/00*
U.S. Cl. 254—204 **8 Claims**



1. A carpet stretching tool extending along a horizontal longitudinal-axis and comprising:

A. a pair of laterally extending and substantially parallel barbed bars including a lead-bar longitudinally spaced from a trail-bar, each barbed bar including a plurality of downwardly extending barbs having sharp-ends collectively defining the tool horizontal bottom-plane and being adapted to removably engage distinct terminal lengths of carpet to be stretched into proximity;

B. longitudinally extending guide means attached to the respective barbed bars and located in elevation above the downwardly extending barbs, said guide means being adapted to permit relative longitudinal movement between the carpet engaging barbed bars while also maintaining them in substantial upright parallelism, said guide means comprising a cross-sectionally non-circular collar extending upwardly from one of the barbed bars and a cross-sectionally non-circular longitudinally extending shank attached to the other barbed bar and slidably extending through said collar; and

C. force application means attached to the respective barbed bars and occupying a distinct elevation located intermediate the downwardly extending barbs and said guide means shank, said force application means being adapted to cause relative longitudinal movement between the carpet engaging barbed bars through said guide means and including:

i. a longitudinally extending elongate threaded stud located in elevation below said guide means longitudinal shank, said stud being firmly attached to one of the barbed bars and being movably surrounded by the other barbed bar; and

ii. a handle threadedly engaged with said elongate stud remote from the stud attachment and adapted to apply direct pressure upon the movable barbed bar as said handle is moved along the threaded stud whereby the movable barbed bar is caused by said handle to move toward the stud attached barbed bar.

4,394,005

COLLAPSIBLE TRAFFIC BARRICADE

James B. Stewart, 436 Smith St., Marion, Ohio 43302

Filed May 26, 1981, Ser. No. 267,171
Int. Cl.³ E04H *17/14*; E01F *13/00*; E04G *1/00, 1/32*
U.S. Cl. 256—64 **2 Claims**

1. A collapsible traffic barricade comprising a reflective panel essentially rectangular in shape and in cross-section, the length of said panel being substantially greater than its height and the height of said panel being substantially greater than its width, two metal leg supports each comprising an upper portion, rectangular in shape and of a size slightly larger than the cross-sectional size of said panel and adapted to receive said panel therein, and being provided with two legs, each of said legs being positioned at obtuse angles to said upper portion of said leg supports both in the plane of said upper portion and in

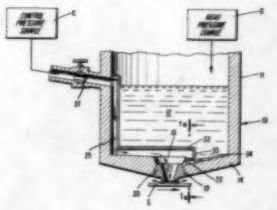
a plane at right angles to said upper portion, and a horizontal connector connecting said lower portions of said leg supports approximately midway thereof, each of said metal legs being provided on the outside of its lower portion with a rectangular member of a size adapted to receive a reflective panel therein.

4,394,006

MOLTEN METAL FLOW CONTROL

John R. Bedell, Madison, N.J., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 7, 1982, Ser. No. 367,031
Int. Cl.³ B22D *39/06*
U.S. Cl. 266—239 **11 Claims**



1. A flow control device for supplying molten metal from a crucible or the like for a continuous casting operation or the like comprising:

nozzle means for receiving and discharging metal flow for casting;

a weir upstream of the nozzle discharge for controlling metal flow through said nozzle means; and means for selectively applying pressurized gas against inflowing molten metal in said weir to stop molten metal flow through said weir and said nozzle means whereby said casting operation may be selectively terminated.

4,394,007

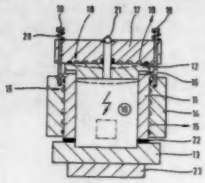
DEBURRING CHAMBER FOR THERMAL DEBURRING

Ernst Leisner, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP80/00056, § 371 Date Apr. 23, 1981, § 102(e) Date Apr. 23, 1981, PCT Pub. No. WO81/00819, PCT Pub. Date Apr. 2, 1981
PCT Filed Jul. 16, 1980, Ser. No. 253,843
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1979, 7927450[U]
Int. Cl.³ C21D *9/00*; B23K *7/00*
U.S. Cl. 266—2/9 **8 Claims**

1. A chamber for thermal deburring of work pieces compris-

ing readily replaceable parts (11,12,13) fitting together to provide respectively the internal lateral, tip and bottom walls of



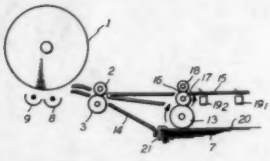
said chamber and more permanent backing parts (17,15,23) assuring support and shock-resisting integrity for the chamber.

4,394,008

AUTOMATIC AND MANUAL SHEET FEEDING MECHANISM

Mitsuhiko Sugiyama, Ebina, Japan, assignor to Rank Xerox Limited, London, England

Filed Apr. 20, 1981, Ser. No. 255,935
Claims priority, application Japan, Apr. 25, 1980, 55-54115
Int. Cl.³ B65H 3/06, 1/26
U.S. Cl. 271—9 **3 Claims**



1. A sheet feed mechanism for a reproduction machine having a photoreceptor surface to which sheets of copy paper are applied for receiving a toner image, and a supply of copy sheets comprising:

a sheet feed mechanism arranged to feed copy sheets to the photoreceptor surface seriatim from a stack of paper and having a stack contacting roller arranged to contact the top sheet of the stack;

a second sheet feed roller arranged above said stack contacting roller and in contact therewith;

a third roller arranged above said second roller and in contact therewith to form a nip therebetween;

a sheet guide means for guiding sheets manually inserted thereon and moved toward said nip;

detection means for sensing the presence of a sheet manually inserted on the sheet guide means as it is moved towards said nip;

means for driving the stack contacting roller; and

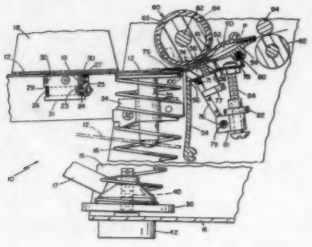
means for moving the stack contacting roller out of contact with said stack while maintaining contact with said second sheet feed roller in response to said detection means sensing the presence of a sheet manually inserted on the sheet guide means, whereby said stack contacting roller rotates in a direction to feed sheets to the photoreceptor surface when in contact with the stack and rotates in the same direction to feed sheets manually through said nip when said stack contacting roller is not in contact with the stack.

4,394,009

SHEET FEEDER WITH BUCKLE RESTRAINT AND FEED ROLL SLIPPAGE

Carl A. Bergman, South Dartmouth; Roy L. Thomas, New Bedford, and Richard A. Bourbeau, North Dartmouth, all of Mass., assignors to Standard Duplicating Machines Corporation, New Bedford, Mass.

Division of Ser. No. 204,559, Nov. 6, 1980, abandoned, which is a continuation of Ser. No. 33,740, Apr. 26, 1979, abandoned.
This application Dec. 7, 1981, Ser. No. 327,950
Int. Cl.³ B65H 3/06, 9/06
U.S. Cl. 271—10 **6 Claims**



1. Apparatus for feeding single sheets of paper from a stack of said sheets, comprising:

a lower guide surface for supporting the under surface of said sheets during feeding thereof,

an upper guide surface spaced above said lower guide surface,

separation means for separating a single sheet from said stack and feeding said single sheet along said lower guide surface, said means for separating including a single, centrally-located feed roll providing a moving feed surface,

registration means downstream of said means for separating, said registration means being activated at the end of a predetermined delay period beginning when said means for separating is activated,

said delay period being sufficient to assure that said single sheet is moved into engagement with said registration means before the end of said period,

said upper and lower guide surfaces extending from said feed roll to said registration means,

said upper guide surface being shaped in the vicinity of said feed roll so as to permit said feed roll to contact said sheets,

said upper and lower guide surfaces being fixed in predetermined positions during operation of said apparatus,

the separation between said upper and lower guide surfaces being greater at a location intermediate said separation and registration means than at said means to define a buckle-restraint region intermediate said means wherein buckling of said sheet occurs after engagement with said registration means and before the end of said delay period, and

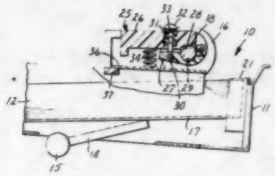
said moving feed surface of said feed roll being adapted to slip with respect to said sheet after said sheet has buckled against the surface of said region,

whereby differences in the amount of time required to feed said sheets from said stack into engagement with said registration means can be accommodated because said delay period can be made longer than the longest feeding time expected and said buckle-restraint region and slipping of said feeding surface can present excessive buckling of sheets arriving before the end of the longer delay period.

4,394,010
SHEET FEEDER

Raymond A. Hogenson, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 23, 1981, Ser. No. 286,338
Int. Cl.³ B65H 3/30
U.S. Cl. 271—22 5 Claims



1. A sheet feeder comprising

frame means for supporting a stack of sheets,

a feed roll for feeding said sheets having an axle which is rotatably supported on said frame means,

means for affording contact of the uppermost sheet within the stack of sheets with said feed roll,

drive means for intermittently rotating said axle,

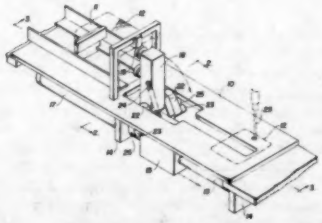
a feed roll brake mounted on said axle, including means for releasably coupling said feed roll brake to said axle affording the rotation of said feed roll brake with said axle, until the application of a predetermined force on said feed roll brake in a direction opposing the rotation of said axle by said drive means, and

biasing means for applying said predetermined force, and for rotating said feed roll brake, said axle, and said feed roll in a direction opposite to the direction of rotation caused by said drive means upon the cessation of the rotation of said axle by said drive means, thereby urging the uppermost sheets in the stack of sheets in a direction opposite to the feeding direction, and accordingly fanning the uppermost sheets of said stack of sheets.

4,394,011
AUTOMATIC CARD OR TAG DELIVERY APPARATUS

Michael L. Dalton, New Canaan, Conn., assignor to Dalton Systems, Inc., Wilton, Conn.

Filed Aug. 20, 1981, Ser. No. 294,810
Int. Cl.³ B65H 3/08
U.S. Cl. 271—107 7 Claims

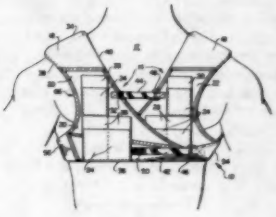


1. A delivery apparatus for cards or tags comprising a substantially level support plate, a hopper structure for a stack of vertical cards on one end portion of the support plate, a linear guideway in fixed parallel relationship to the support plate below the support plate, a carriage element movably engaged with said guideway, a linear power actuator connected with said carriage element to drive it in opposite directions on the guideway, a vacuum arm means pivotally attached to the carriage element on a transverse horizontal pivot axis and having attached crank arm means, a spring biasing the vacuum arm means toward a level rest position when the carriage element is at the other end portion of the support plate, and a fixed stop in the path of movement of said crank arm means at an intermediate part of the support plate and engaging the crank arm means to swing the vacuum arm means to a substantially vertical position above the support plate in opposition to said spring, whereby the vacuum arm means can pick up a vertical card from said hopper structure and swing the card to a level position while transporting the card to said rest position where the card can be attached to an article.

4,394,012
WEIGHTED EXERCISE VEST

Jeffrey T. Egbert, 22 College Ave., Rexburg, Id. 83440, and Jason S. Egbert, 5036 Whitaker, Pocatello, Id. 83201

Filed Jun. 22, 1981, Ser. No. 275,914
Int. Cl.³ A63B 21/12
U.S. Cl. 272—119 20 Claims



1. An exercise vest adapted to be worn about the chest, back and shoulders of the wearer thereof comprising:

(a) a contoured shoulder fabric portion adapted to be worn about the back of the neck and over shoulders of the wearer terminating in a horizontal lower back edge and a pair of horizontal lower front edges;

(b) a trapezoidal back fabric portion terminating in parallel top and bottom edges and symmetrical generally downwardly and inwardly tapered side edges, said top edge being continguous with and sewn to the lower back edge of said shoulder portion;

(c) a fabric chest portion comprising right and left flaps adapted to overlap across the chest of the wearer, said right flaps and left flaps being essentially mirror image of each other, each flap being generally trapezoidal in shape having top and bottom parallel edges, said bottom edge being greater in length than said top edge, an outer generally vertical side edge connecting the outermost ends of said top and bottom edges and an inner generally diagonal edge connecting the innermost ends of said top and bottom edges, said inner diagonal edge being greater in length than said outer vertical side edge, said top edges being continguous with and sewn to the lower front edges of said shoulder portion;

(d) a pair of adjustable strap securing means interconnecting the lowermost portions of said tapered side edges of said back portion with the lowermost portion of said outer

generally vertical side edges of said right and left flaps of said chest portion;

(e) fastening means for securing said flaps of said chest portion in an overlapping position across the chest of the wearer comprising a pair of straps located on one flap of said chest portion, one strap being affixed at the corner formed by the juncture of the inner diagonal and lower edges of the flap so as to form an extension of said corner and the other strap being affixed along said inner diagonal edge approximately midway between said top and bottom edges, and a corresponding pair of strap receiving loops located on the opposite flap, one of said receiving loops being affixed near the corner formed by the juncture of the outer vertical side edge and the bottom edge and the other receiving loop being affixed along said diagonal edge approximately midway between said top and bottom edges, said straps containing means to secure each strap in a fixed position after said strap has passed through its corresponding receiving loop;

(f) a plurality of weight pockets affixed to said back and chest portions, said weight pockets being of a uniform size and being uniformly distributed thereon;

(g) a plurality of weight modules adapted to be selectively and removably inserted into said weight pockets, each of said weight modules being configured to have a size and shape that fills said weight pockets, said weight modules thereby being constrained from all movement once inserted inside one of said pockets; and

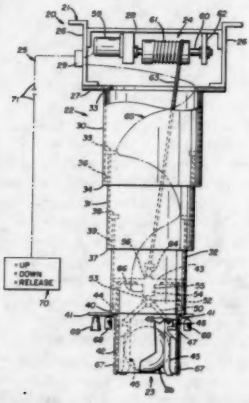
(h) a plurality of identical weights, each of said weights being of a uniform size and mass, and being adapted to be securely held inside of said weight modules.

4,394,013

APPARATUS FOR BASKETBALL

James E. Larsen, Lincoln, Nebr., and Charles E. Rogers, Akron, Ohio, assignors to Randall Industries, Inc., Akron, Ohio

Filed May 28, 1982, Ser. No. 383,118
Int. Cl.[3] A63B *71/02*
U.S. Cl. 273—1.5 R 4 Claims



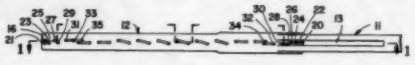
1. Apparatus for use above a playing court for the game of basketball, comprising: a suspension frame adapted to be secured to a ceiling or structural support above the court; a telescoping elevator unit suspended beneath said frame and having a plurality of coaxially interfitting segments including an outer segment and an inner segment, said outer segment having an upper end adapted to be secured to said frame; a basketball mechanism carried coaxially of said elevator unit inner segment and having arcuately moving paddles to accept and hold a basketball, said paddles being interconnected by a motion linkage to a linkage actuator for selective movement to drop a held basketball toward the playing court; a hoist mechanism mounted on said frame and having a cable trained down and through said elevator unit, the free end of said cable being connected to said basketball mechanism; and, an electrical system to selectively energize said hoist mechanism to raise or lower said elevator unit by movement of said basketball mechanism, and to selectively energize said linkage actuator of said basketball mechanism.

4,394,014

TENNIS RACKET

John A. Balaban, 4142 Graham St., Pleasanton, Calif. 94566

Filed Apr. 27, 1981, Ser. No. 257,992
Int. Cl.[3] A63B *49/02*
U.S. Cl. 273—73 G 4 Claims



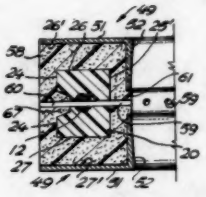
1. A tennis racket having a handle, a bow, and a throat which connects the handle and the bow, said bow having pairs of coaxial holes drilled therethrough to receive strings, an open slot in said throat, said slot being wider than said strings and positioned so that the axis of a hole passing through said throat will lie within said slot, and so that the axes of at least some of said coaxial holes pass through said throat to the exterior of the racket without contacting any portion of the racket.

4,394,015

RACKET STRUCTURE

Omar J. Bosnia, Buenos Aires, Argentina, assignor to Taybos Sociedad Anonima, Buenos Aires, Argentina

Filed Jan. 5, 1982, Ser. No. 337,150
Int. Cl.[3] A63B *49/02, 49/10*
U.S. Cl. 273—73 C 9 Claims



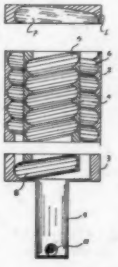
1. A racket structure comprising a one-piece composite member having two contiguous parallel straight end portions continuing into an intermediate open oval shaped, arcuate portion, a bridge portion extending between and connected to said end portions adjacent the beginning of said arcuate portion and closing said open oval shaped, arcuate portion, said bridge and oval portions defining a head frame section for stringing with a taut string, said head frame section to form a striking surface, said parallel straight end portions defining a handle section with a grip, said one-piece composite member having an inner light-weight soft plastic core member defining a longitudinal center line and having an inner face, an outer face and further including a central prestressed longitudinal cord member, said open oval shaped arcuate portion of said core member having between said center line and said outer face, crosswise to said center line arranged spaced apart anchoring recesses each continuing by a bore from said center line towards said inner face, each of said bores being oriented towards the space circumscribed by said frame section, a glass fiber, reinforced outer hard plastic layer, sheathing said core and entering said recesses by way of anchoring portions, each of said anchoring portions including a perforation coaxial with the pertinent

bore, a pair of resilient, flat cover members mounted an opposite sides on said composite member, each cover member having a head portion and a handle portion, each head portion being of oval shape substantially equal to the shape of said head frame section, each handle portion being of substantially the same shape as said handle section, an endless oval shaped inner rim integral with said head portion, the height of said rim being less than half the height of the inner face of said head frame section, and each rim abutting on said inner face and leaving between them a central free portion into which end said bores for said string.

4,394,016
GAME USING THE HELICAL MOVEMENT OF A BALL OR VEHICLE

Pavlos Manos, Louka Ralli 8, Pireaus, Greece

Filed Dec. 16, 1980, Ser. No. 216,977
Claims priority, application Greece, Feb. 23, 1980, 61269
Int. Cl.³ A63F 7/04
U.S. Cl. 273—109 **1 Claim**



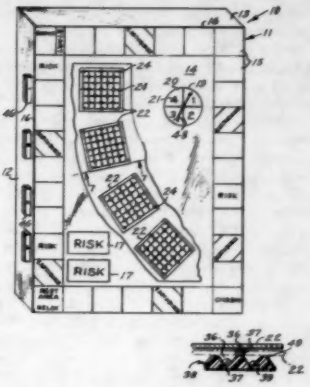
1. An amusement device comprising:
a first cylinder having a helicoidal passageway formed therein;
a second cylinder having a helicoidal passageway formed therein and surrounded by said first cylinder;
wherein said helicoidal passageway from said first cylinder intersects with said helicoidal passageway of said second cylinder forming a continuous passageway in said first and second cylinders, said continuous passageway comprising channels in the walls of said first and second cylinders,
a hollow handle mounted beneath said first and second cylinders, and
a movable member arranged for free movement within said continuous passageway, and said hollow handle,
wherein said movable member comprises a ball.

4,394,017
EARTHQUAKE GAME

Rick D. Maloy, Rte. 2, Newcomerstown, Ohio 43832

Filed Jun. 5, 1981, Ser. No. 270,894
Int. Cl.³ A63F 3/00
U.S. Cl. 273—237 **7 Claims**

1. An earthquake game, comprising, in combination, a board, with a pair of side walls, and a pair of end walls fixedly secured to it in a suitable manner, a border of adjacent segments imprinted on said board, for use with a plurality of playing cards, a plurality of square members freely received in openings through said board, for simulating cities, a plurality of mechanisms with circuit means, secured to said board, for vibrating each of said square members, a plurality of building structures removably received on said square members, a spinner device inscribed on said board, for selecting which square member is

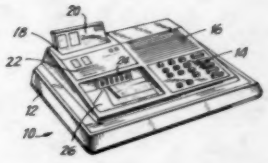


to be vibrated by the players, and a pair of dice for the use of each player, to determine which player will start said game off.

4,394,018
ELECTRONIC LOGIC GAME

Philip Orbanes, Topsfield, Mass., and Julius Cooper, New Hyde Park, N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Continuation of Ser. No. 86,606, Oct. 19, 1979, abandoned. This application Jul. 29, 1982, Ser. No. 403,232
Int. Cl.³ A63F 3/00
U.S. Cl. 273—237 **1 Claim**



1. An electronic logic game for play by at least one player to identify which one of predetermined "suspects" has committed a "crime", comprising:
a keyboard having manually actuable keyboard switches including an "on" key to initiate play, a "suspect" key to selectively establish a "suspect" questioning mode or a "suspect" accusation mode, numeric keys actuable to enter numerical data for identifying a "suspect" and further actuable to enter predetermined "questions", a "question" key actuable to enable said predetermined "questions" to be asked of the identified "suspect", an "end turn" key actuable to terminate the "questioning" of said identified "suspect", and an "accuse" key actuable to "accuse" an identified "suspect" of being guilty of said "crime";
a visual display including graphic means operable in response to the actuation of said "on" key to provide a visual display representing the location of said "crime" and the identity of the "suspect" who is a "victim" of that "crime", said graphic means being further operable in response to the actuation of said "question" key and a numeric key to provide a visual display representing an "answer" to a "question", and said graphic means being additionally operable in response to the establishing of a

"suspect" questioning mode to provide a visual display of the "alibi" of said identified "suspect";

audio indicating means for indicating an erroneous "question" of an identified "suspect", for indicating a false "accusation" of an identified "suspect", and for indicating the correct "accusation" of an identified "suspect";

a plurality of "suspect" cards, each indicating the identity of a respective "suspect" and selected "questions" that may be asked of said respective "suspect"; and

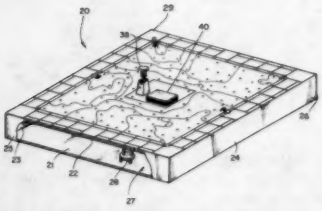
microprocessor means programmed to store, for each of said "suspects", data indicating the "alibi" of each "suspect" for each "crime", data indicating the "answer" of each "suspect" to each of said selected "questions", data indicating whether each "suspect" is a victim of each "crime", and data indicating whether each "suspect" is guilty of each "crime", said microprocessor means being initially operative to retrieve data stored therein indicating the "victim", "location" and "guilty" "suspect" of a "crime" and to operate said visual display for displaying information representing said "victim" and "location" of said "crime", said microprocessor means being operative in response to the actuation of keys identifying a respective "suspect" to retrieve the data indicating the "answer" of said identified "suspect" to a selected "question" and to operate said visual display for displaying information representing said "answer", and said microprocessor means being operative in response to the actuation of keys identifying an "accused" "suspect" to retrieve said data indicating whether the "accused" "suspect" is "guilty" and to operate said audio indicating means to indicate if said "accused" "suspect" is "guilty".

4,394,019

OIL DRILLING GAME BOARD

James R. Anthony, and David M. Rush, both of Indianapolis, Ind., assignors to Antfamco, Inc., Carmel, Ind.

Filed Apr. 17, 1981, Ser. No. 255,159
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—256 **4 Claims**



1. An oil well drilling game comprising:

a game board having a hollow interior and a playing surface thereabove, said playing surface having marked thereon a plurality of oil properties with each property having associated therewith oil well holes extending through said playing surface into said interior;

a plurality of movable oil well bodies within said interior, said bodies having contact surfaces spaced from said playing surfaces different distances associated with the amount of oil for a given oil well; and

oil drilling means extendable through to drill any of said holes and operable to contact any of said contact surfaces located therebeneath to indicate the amount of oil for a given oil well and wherein:

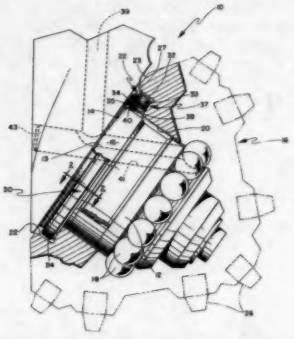
said game board has a circumferentially extending edge portion defining a continuous playing path with said properties positioned on said circumferentially extending edge portion and grouped into different categories, said game board has a center portion surrounded by said edge portion with said oil well holes located in said center portion and grouped into separate oil well holes located in said center portion and grouped into separate oil field regions providing a separate region for each of said categories, said oil field regions are contiguous with spaces of the particular category associated therewith, at least one of said categories have multiple non-adjacent properties located on said edge portion and contiguous with one of said regions which extends across said center portion between opposite edge portions.

4,394,020

HIGH-SPEED SEAL

Erwin S. Oelke, Cypress, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Oct. 18, 1982, Ser. No. 434,996
Int. Cl.³ F16J *15/34*; F16C *33/78*; E21B *10/08*
U.S. Cl. 277—1 **12 Claims**



1. A seal apparatus for a rotary cone rock bit, said seal being positioned in a cavity formed between a journal extending from a leg of said rock bit and a rotatable cone mounted on said journal, said seal comprising:

a metal ring, said ring having a diameter that will fit within said cavity, a peripheral surface formed by said ring subsequently serving as part of a metal-to-metal seal, an annular seal gland channel formed by said metal ring, said channel being positioned adjacent said peripheral surface,

a resilient material partially encapsulating said metal ring, said resilient material forming an O-ring type of seal in said cavity formed between said leg of said rock bit and said rotatable cone,

a separate seal packing ring contained within said seal gland channel in said metal ring, during initial rotation of said cone on said journal, a portion of said separate seal packing ring adjacent said metal peripheral surface eventually wears away exposing said peripheral metal surface to an adjacent cavity wall, said metal surface and said cavity wall subsequently forming a lapped sealing surface, said separate seal packing ring prevents loss of a lubricant stored within said rock bit during the time said peripheral surface of said metal ring is forming a lapped seal against said adjacent wall of said cavity.

4,394,021

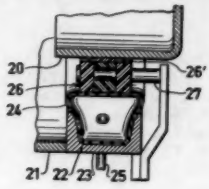
CONTACT SEALING

Jouni A. Merilä, Pajala, Sweden, assignor to Luossavaara-Kiirunavaara AB, Stockholm, Sweden

Filed Feb. 19, 1981, Ser. No. 235,858
Claims priority, application Sweden, Feb. 25, 1980, 8001455
Int. Cl.³ F16J *15/46*
U.S. Cl. 277—34.3 **1 Claim**

1. A contact sealing for sealing an annular space between two relatively rotating members, particularly for sealing a material flow to a rotary drum from an opening in a stationary wall, one of the members being provided with an annular

sealing surface and the other member being provided with an annular bottoming groove facing the sealing surface of said one member, the bottoming groove receiving a closed pressurized flexible and expandable annular hose and an annular sealing member, said sealing member being force-engaged by said hose



to seal about said sealing surface, said sealing member being a flexible strip, having two ends respectively being provided with a groove and a tongue, the groove and tongue being interconnected and secured by an axial stud, and the stud in turn being secured to said other member.

4,394,022

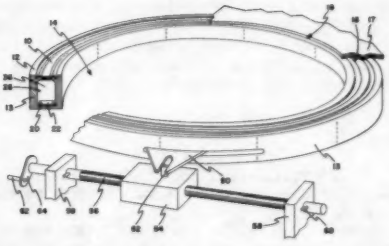
MECHANICALLY EXPANDABLE ANNULAR SEAL

Richard F. Gilmore, Kennewick, Wash. (granted to U.S. Department of Energy under the provisions of 42 U.S.C. 2182)

Filed Sep. 29, 1981, Ser. No. 306,998

Int. Cl.³ F16K *27/04;* **F16J** *15/16;* **F16L** *37/20*

U.S. Cl. 277—36 **10 Claims**



1. An expandable annular reusable seal assembly for hermetically sealing a first generally planar stationary containment surface to a second generally planar stationary containment surface wherein said second containment surface is proximate, spaced apart, and generally parallel with respect to said first containment surface, said seal assembly comprising;

(a) a rigid, circular ring having a longitudinal axis;

(b) means for movably and generally parallelly attaching said ring to said first containment surface so that said ring's motion is generally restricted to a rotation about its longitudinal axis;

(c) a plurality of ring wedges fixed to said ring, each of said ring wedges having a generally identically inclined square-thread helical-shaped surface oriented obliquely away from said ring and obliquely towards said second containment surface, said ring wedges each also having the shape of an annular segment and together similarly disposed in an annular, generally hole-saw-tooth-like array coaxial with said ring;

(d) a plurality of seal wedges, each of said seal wedges contacting said inclined surface of a corresponding said ring wedge and having a first face generally lying a plane disposed towards, and generally parallel with, said second containment surface, said seal wedges each also having the shape of an annular section and together disposed in a generally contiguous annular cluster with said first faces together generally lying in a common plane;

(e) means for slideably attaching each of said seal wedges to its corresponding said ring wedge so that each of said seal wedges is slideable along said ring wedge's inclined surface;

(f) means for restricting the motion of said seal wedges to be perpendicular to said first containment surface;

(g) an annular elastomer seal, generally matching said ring, having its inner and outer circumference hermetically attached to said first containment surface, said elastomer seal disposed between said first faces of said seal wedges and said second containment surface, and having a central annular portion attached to said first faces of said seal wedges; and

(h) mechanical means for rotating said ring from a first angular position to a second angular position, and maintaining said ring at said second angular position, to rotate said ring wedges to slide forth said seal wedges to extend said elastomer seal towards said second containment surface to form a fluidtight annular barrier, and for counterrotating said ring from said second angular position to said first angular position, and maintaining said ring at said first angular position, to counterrotate said ring wedges to slide back said seal wedges to retract said elastomer seal from said second containment surface to remove said fluidtight annular barrier.

4,394,023

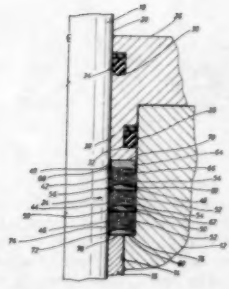
HIGH TEMPERATURE VALVE STEM PACKING WITH COILED GRAPHITE SEAL RINGS

Alberto L. Hinojosa, Houston, Tex., assignor to Daniel Industries Inc., Houston, Tex.

Filed Sep. 29, 1982, Ser. No. 427,463

Int. Cl.³ F16K *31/44;* **F16J** *15/12*

U.S. Cl. 277—124 **3 Claims**



1. A high temperature stem packing assembly for valves, comprising:

(a) a plurality of graphite seal rings composed of spirally coiled graphite tape originally coiled in such manner as to form generally planar circular end surfaces;

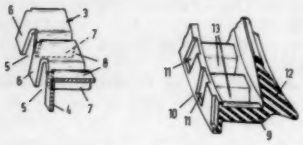
(b) metal packing adapter ring means being interposed between each of said graphite seal rings, said packing adapter ring means defining convex circular end surface means at one end thereof and planar circular end surface means at the opposite end thereof, said convex circular end surface means deforming the end surface of the seal ring in contact therewith from said originally generally planar circular surface configuration to a corresponding concave configuration mating with said convex circular surface of said adapter ring means.

4,394,024

SEAL FOR USE WITH PIPES TO BE FITTED ONE INTO ANOTHER WITH SPIGOT AND SOCKET ENDS

Johannes C. Delhaes, Voerendaal-Ten Esschen, Netherlands, assignor to Rubber-en Kunststoffabriek ENBI B.V., Netherlands

Filed Jun. 2, 1981, Ser. No. 269,718
Claims priority, application Netherlands, Jun. 4, 1980, 8003258
Int. Cl.³ F16J 15/10; F16L 21/00
U.S. Cl. 277—207 A 6 Claims



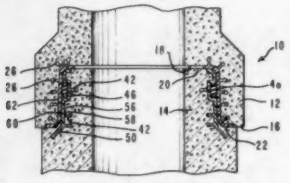
1. A seal for use with pipes to be inserted one into another by means of spigot and socket ends comprising a sealing sleeve made of an elastomeric material, said sleeve being clamped within the socket by a radially resilient bushing provided with outward corrugations extending parallel to the axis of said bushing, said bushing is provided with a collar which is segmented by cuts extending throughout the entire width of said collar.

4,394,025

PIPE COMPRESSION SEAL FOR BELL AND SPIGOT JOINT

Kenneth W. Anderson, Springfield, Ill., assignor to Anderson Seal Company, Inc., Springfield, Ill.

Filed Nov. 9, 1981, Ser. No. 319,297
Int. Cl.³ F16J 15/10; F16L 21/02
U.S. Cl. 277—207 A 5 Claims



1. A pressure resistant system for joining concrete pipes in end-to-end relationship wherein said first pipe terminates in a bell end and the second pipe terminates in a complimentary spigot end telescopically received therein, the bell end defining a bell end face and an internal offset face radically and axially offset from the bell end face, and the spigot end defining a spigot end face and an external offset face radially and axially offset from the spigot end face, the end face and offset face of said bell end of said spigot being connected, respectively, by inner and outer seal mounting surfaces, said system comprising:

a bell end sealing ring extending from the bell offset face to the bell end face along the bell seal mounting surface, said ring mounting a plurality of mutually spaced, outwardly directed, circumferential flanges embedded in said bell;

a spigot end sealing ring extending from the spigot offset face to the spigot end face along the spigot seal mounting surface, said ring mounting a plurality of mutually spaced, inwardly directed, circumferential flanges embedded in said spigot, the end of said ring adjacent said spigot offset face mounting an integral sealing flange extending outwardly at an angle thereto and embedded in said pipe below the spigot offset surface, said ring further defining a central, circumferential, concave groove embedded in said spigot; and

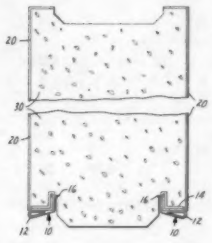
an O-ring seal retained in the spigot ring groove between the spigot and bell sealing rings when the spigot end is telescopically received in the bell end.

4,394,026

PANEL EDGE GASKET WITH COMPRESSIBLE SEALING PORTION

Kenneth L. Kaiser, and William C. Shirley, both of P.O. Box 248, Second & Elm, Hudson, Wis. 54016

Filed Sep. 4, 1981, Ser. No. 299,403
Int. Cl.³ F16J 15/10; E06B 7/23
U.S. Cl. 277—231 7 Claims



1. An edge gasket for a foamed-in-place panel comprising

(a) a compressible sealing portion,

(b) attachment means for attaching said sealing portion to a panel edge, wherein said attachment means is L-shaped with an interior channel which is adapted to engage a substrate having two 90° bends therein, and

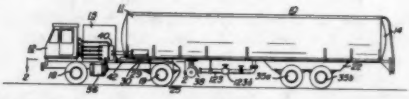
(c) a flexible wing carried by said attachment means.

4,394,027

TRACTOR-TRAILER LAND VEHICLE

Robert G. Watkins, Jr., No. 2 Longview Rd., R.D. #4, Coatesville, Pa. 19320

Continuation of Ser. No. 26,056, Apr. 2, 1979, Pat. No. 4,272,089, which is a continuation of Ser. No. 769,518, Feb. 17, 1977, Pat. No. 4,149,732. This application May 11, 1981, Ser. No. 262,217
The portion of the term of this patent subsequent to Apr. 17, 1996, has been disclaimed.
Int. Cl.³ B60P 3/22
U.S. Cl. 280—5 C 5 Claims



1. A fuel transport land vehicle for dispensing jet fuel to an aircraft comprising

a tractor, a trailer having a tank for carrying jet fuel,

means for detachably coupling said tractor to said trailer,

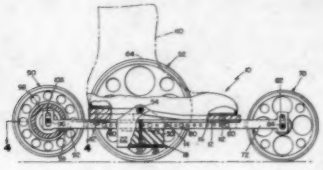
pumping module means enclosed within a housing having disposed therein means for filtering said jet fuel and means for modulating the flow of said jet fuel from said tank, and

means for detachably securing said housing to said tractor whereby said pumping module means may be easily removed from said tractor upon malfunction of said pumping module means.

4,394,028
SKATE

Joseph S. Wheelwright, 551 Tremont St., Boston, Mass. 02116

Filed Mar. 13, 1981, Ser. No. 243,445
Int. Cl.³ A63C *17/04*
U.S. Cl. 280—11.19 17 Claims



1. A roller skate comprising

a foot supporting plate carrying means for engaging a human foot thereon,

a front wheel carried by a yoke fixedly connected to said plate,

said front wheel extending above said plate and being in front of said means for engaging,

a pair of side wheels mounted on both sides of said plate and extending above said plate,

means for suspending said plate on said side wheels for lateral tilting motion of said plate and said front wheel relative to said side wheels, and

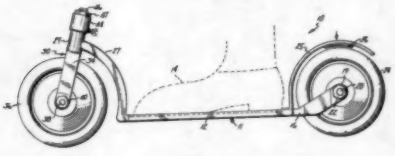
brake means comprising a rear brake wheel secured to the rear of said plate and activated by movement of a skater's foot,

whereby said plate and front wheel can be tilted as a skater leans during turning while said front and side wheels remain on the ground.

4,394,029
FOOT OPERATED VEHICLE

Frank E. Holmgren, P.O. Box No. 8, Big Lake, Minn. 55309

Filed Apr. 3, 1981, Ser. No. 250,762
Int. Cl.³ A63C *17/04*; B62K *21/10*
U.S. Cl. 280—11.23 14 Claims



1. A foot operated vehicle comprising:

a frame having a generally flat foot support platform and a tubular collar secured to the forward end of the frame positioned in a generally upright orientation;

rear wheel means supporting the rear of the platform;

a steerable front wheel assembly connected to a forward portion of the frame in supportive relationship to the forward portion of the platform, said front wheel assembly including a steering shaft, a front wheel rotatably mounted to the steering shaft, said steering shaft extending through said tubular collar for pivotally connecting the front wheel to the frame for pivotal movement about a generally upright axis, said steering shaft having an upper end portion extended outwardly of the collar;

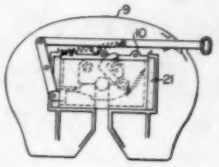
bias means connected between the frame and the tube collar comprised as a helical spring disposed in surrounding relationship to the upper end portion of the steering shaft extended outwardly of the collar and having one end connected to the collar and an opposite end connected proximate the upper end of the steering shaft, said spring operable to bias the front wheel in a straight ahead position with respect to the frame whereby upon execution of a turn the forward wheel pivots in the direction of the turn against the influence of the bias means, and is returned to a straight ahead position by the bias means upon completion of the turn, and;

a cap assembled to the top end of the steering shaft for rotation therewith and having downwardly extended cylindrical sidewalls positioned in covering relationship to the spring and in overlapping relationship to the upper end of the tubular collar.

4,394,030
KING PIN CONNECTING MECHANISM

Akira Inoue, Kitakyushu, Japan, assignor to Hitachi Metals, Ltd., Japan

Filed Jan. 26, 1981, Ser. No. 228,180
Int. Cl.³ B62D *53/06*
U.S. Cl. 280—434 3 Claims

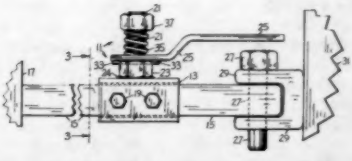


1. A connecting mechanism for connecting a king pin fixed to a trailer to a fifth wheel plate provided on a tractor, comprising: a substantially enclosed box structure having a slot extending longitudinally in one side thereof for receiving said king pin therein, and having an opening in an adjacent side thereof contiguous with said slot for permitting entry of said king pin into said box structure and into said slot, said box structure having pivotally mounted therein at least a portion of the parts for connecting said king pin, said box structure being detachably attached in a secure manner to the lower face of said fifth wheel plate, with said one side of said box structure adjacent thereto.

4,394,031
EASILY MOUNTABLE SWINGABLE-ARM DRAW-PIN RETAINER

Roy C. Barton, 724 Main St., and Dale A. Smith, Box 169, both of Mt. Vernon, Ill. 62864

Filed May 27, 1980, Ser. No. 153,157
Int. Cl.³ B60D *1/02*
U.S. Cl. 280—515 1 Claim



1. In a tow-hitch having a bar attachable to a first vehicle, a therewith-mating clevis attachable to a second vehicle, and a conventional hitch tow-pin couplingly insertable downwardly through alined bores in said bar and said clevis, the improvement comprising: a tow-pin-retaining fully assembled unit having a vertically disposable pivot pin, means for fixing said pivot pin to tow-hitch structure so as to be closely adjacent the axis of said tow-pin in its hitch-coupling arrangement, an arm

mounted on said pivot pin for horizontal swinging to and from a position closely above the top of said tow-pin, and detent means for yieldably holding said arm in its tow-pin-overlying and -retaining position, said tow-pin-retaining unit comprising a short sleeve telescopically slidable over a conventional draw-bar, said pivot pin being firmly fastened to the top of said sleeve, said means for fixing being set screws for releasably anchoring said sleeve to said draw-bar, and said detent means comprising a nut fixed to said pivot pin and radially grooved on its arm-facing surface, rounded protuberances on said arm for engaging in the grooves of said nut, and a coil spring around said pivot pin biasing said arm toward said nut.

4,394,032

SKI SAFETY BINDING

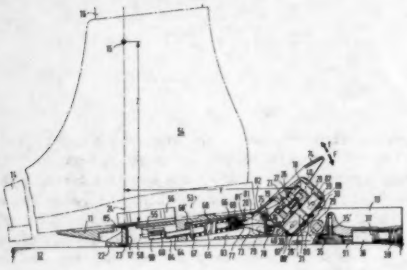
Ralf Storandt, Leonberg; Manfred Richert, Farchant, and Georg Scheck, Leonberg, all of Fed. Rep. of Germany, assignors to Geze GmbH, Leonberg, Fed. Rep. of Germany

Filed Nov. 26, 1980, Ser. No. 210,615

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1979, 2948275

Int. Cl.³ A63C *9/081*

U.S. Cl. 280—618 **24 Claims**



1. A ski safety binding for protecting a skier during skiing against both a dangerous bending moment acting on a leg of the skier at an endangered section of the skier's leg and a dangerous torsional moment acting about the leg, said ski safety binding comprising: a sole plate; a ski boot securing system carried by said sole plate for releasably securing a ski boot to said sole plate; mounting means for mounting the sole plate on a ski having an upper surface and a longitudinal direction, for limited displacement in said longitudinal direction, and for limited pivotal movement about a transverse axis and about a vertical axis extending substantially along the skier's leg; guide means disposed between said sole plate and said ski and displaced in said longitudinal direction from said vertical axis, said guide means including an inclined guide extending at an inclined angle to said upper surface of the ski in a vertical plane including said longitudinal direction and a transverse guide extending in a direction transverse to said inclined guide; first retaining means for retaining the sole plate in a specified position along said inclined guide; second retaining means for retaining the sole plate in a specified position along said transverse guide; first resilient means permitting resilient deflection of said first retaining means on the occurrence of excessive forces thereon due to said bending moment to allow movement of said sole plate along said inclined guide; second resilient means permitting resilient deflection of said second retaining means on the occurrence of excessive forces thereon due to said torsional moments to allow limited movement of said sole plate along said transverse guide, and sensor means responsive to said limited movement along said inclined guide and to said limited movement along said transverse guide to release said boot securing system.

4,394,033

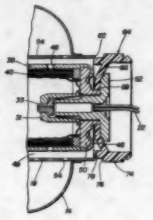
TEMPERATURE COMPENSATING ELASTIC CONE

George W. Goetz, Detroit; Arne J. Santti, Lapeer, and Gary R. LaLonde, Sterling Heights, all of Mich., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Feb. 26, 1981, Ser. No. 238,318

Int. Cl.³ B60R *21/08*

U.S. Cl. 280—736 **1 Claim**



1. A passive occupant-restraint system comprising

(a) an inflatable cushion,

(b) a fluid generator operatively connected to said cushion,

(c) means to fire said generator and create inflation fluid,

(d) discharge ports in said generator directing flow of inflation fluid into said cushion, and

(e) means coaxial with said generator to vent fluid directly therefrom and beyond said cushion and responsive to an increase in operating temperature, said venting means having a flexible web terminating in an axially extending rib fitting within the end of said generator and moveable substantially axially from that position closing the end of said generator to an open position in response to said increase.

4,394,034

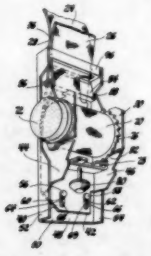
BELT CLAMP FOR RETRACTOR

James E. Murphy, Royal Oak, and Kenneth H. Reid, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 8, 1981, Ser. No. 252,028

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—801 **3 Claims**



1. A retractor for vehicle body occupant restraint belt comprising:

a frame having a belt reel for winding and unwinding the restraint belt;

means mounting the frame for limited movement on the vehicle body;

locking means acting between the frame and the reel and selectively operable to lock the reel against belt unwinding rotation;

a clamping member carried by the frame independently of

the belt reel for limited movement with the reel and the frame;

a clamping abutment mounted on the vehicle body in spaced relation from the clamping member and from the belt reel and cooperating with the clamping member to define a belt passage through which the belt travels during winding and unwinding from the reel; and

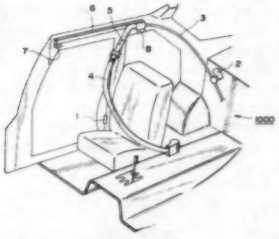
yieldable means acting between the frame and vehicle body to establish the frame at a normal position spacing the clamping member from the clamping abutment to permit travel of the belt therebetween during belt winding and unwinding, said yieldable means yielding upon the occurrence of a predetermined occupant restraint load imposed on the frame subsequent to lockup of the reel by the reel locking means to permit the frame to move relative the vehicle body in the direction of belt loading and effect clamping of the belt between the clamping member and the clamping abutment to fix the length of the belt against spooling down on the reel.

4,394,035

AUTOMOTIVE VEHICLE SEAT BELT DEVICE

Yoshimi Sato, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 17, 1980, Ser. No. 187,870
Claims priority, application Japan, Sep. 19, 1979, 54-119210
Int. Cl.³ A62B *35/00*
U.S. Cl. 280—804 **14 Claims**



1. An automotive vehicle seat belt device, comprising:

(a) a slide mechanism fixed to the vehicle, said mechanism comprising:

(i) a slide rail; and

(ii) a slide element slidably mounted to said rail;

(b) a seat belt anchored at one end thereof to the vehicle and connected at the other end thereof to said slide element;

(c) a drive motor operably connected to said slide element to move said slide element along said slide rail; and

(d) an electric circuit for controlling the operation of said drive motor, comprising:

(i) a front travel limit switch operative in response to the position of said slide element;

(ii) a rear travel limit switch operative in response to the position of said slide element;

(iii) a door switch operative in response to the door position;

(iv) first changeover means responsive to a first position of said door switch and a switch for driving said motor in one direction to move said slide element to the front;

(v) second changeover means responsive to a second position of said door switch and a first position of said rear travel limit switch for driving said motor in the reverse direction to move said slide element to the rear; and

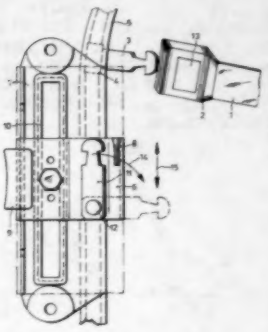
(vi) control switching means for disabling the effect of the movement of said door switch to its first position, said control switching means being actuated in response to predetermined vehicle conditions.

4,394,036

PASSIVE SAFETY BELT ARRANGEMENT

Christian Hildebrandt, Gifhorn-Wilsche, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed May 19, 1981, Ser. No. 265,226
Claims priority, application Fed. Rep. of Germany, May 20, 1980, 3019158
Int. Cl.³ B60R *21/02*
U.S. Cl. 280—804 **4 Claims**



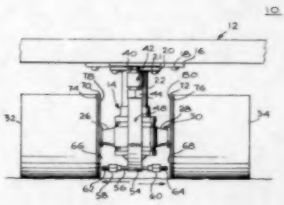
1. A passive safety belt arrangement for vehicles, for example passenger automobiles, has a safety belt with one end being connectable, by means of a manually-operable closing device, with a slide which can be displaced by a drive means, said slide being displaceable in a guide held on the vehicle body between a release position, in which the belt is lifted off the body of a vehicle occupant, and a restraining position, in which the belt is applied to the body of the vehicle occupant, characterized in that in the region of the restraining position of the slide, a counterpart, which is connectable with the a part of the closing device at the belt end, is fastened to a stationary point on the vehicle body.

4,394,037

SPARK-GENERATING ROLLER SKATE ASSEMBLY

David H. Kuntz, 11810 Bel Ter., Los Angeles, Calif. 90049

Filed Dec. 1, 1980, Ser. No. 211,820
Int. Cl.³ A63C *17/026*
U.S. Cl. 280—816 **17 Claims**



1. An improved spark-generating roller skate assembly, said assembly comprising, in combination:

(a) a plurality of rollers;

(b) a weight-bearing frame securing said rollers in spaced relation for rotation; and

(c) a spark generator comprising:

(i) an abrasive disposed on a surface of at least one of said rollers, which surface rotates during skating utilizing said assembly but which surface does not contact the ground during said skating.

(ii) a sparking element which generates a spark when moved into frictional contact with said abrasive, and

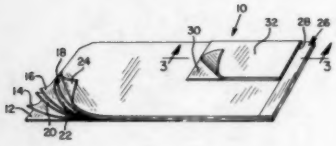
(iii) a flexible resilient holder bearing said sparking element and arranged to normally position said sparking element out of contact with said abrasive but in a position close enough thereto so that vibrations imparted to said holder during skating utilizing said assembly move said sparking element into and out of brief intermittent contact with said abrasive.

4,394,038

ADHESIVE-BACKED BOOKLET FOR CREDIT CARD TRANSACTION

Paul E. Klein, 601 First St., Lake Oswego, Oreg. 97034

Filed Jan. 9, 1981, Ser. No. 223,854
Int. Cl.³ G09F *3/10*
U.S. Cl. 282—1 R **5 Claims**



1. In combination a transaction record including a card having print-impartible characters, and an imprinting device having a support surface with a defined region for receiving such a card, and a pressure platen cooperative with such surface and manipulatable relative thereto to effect an imprinting operation, said record being imprintable and, comprising

a recording sheet placeable on said surface, said sheet having a defined expanse disposed to extend, when said sheet is placed on said surface, over at least a portion of a card received by such defined region, and

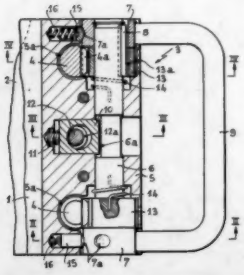
pressure-responsive adhesive means distributed over the expanse face placeable adjacent said card for capturing and releasably retaining with said sheet said card following an imprinting operation.

4,394,039

MULTIPLE UNIONS FOR SIMULTANEOUSLY JOINING A PLURALITY OF PNEUMATIC OR HYDRAULIC PIPES

Jean-Luc Burquier, Veyrier du Lac, France, assignor to S.A. Des Etablissements Staubli, Faverges, France

Filed Mar. 16, 1981, Ser. No. 244,482
Claims priority, application France, Mar. 25, 1980, 80 07625
Int. Cl.³ F16L *55/00, 39/00, 37/00*
U.S. Cl. 285—85 **8 Claims**



1. In a multiple union device for simultaneously joining the complementary male and female elements of a plurality of elementary unions equipped with seals, said union device comprising:

(a) first and second plates for supporting the male and female elements and operative to be brought close together so as to compress the seals associated with the elements carried by said plates, said second plate having fixed thereto paired toothed columns which project from its surface toward the first plate, and said first plate supporting opposite each pair of columns a block having bores disposed to slidably receive said columns;

(b) automatic latching means to retain said plates in an operative position in which the seals would be compressed between the male and female elements of the elementary unions, said latching means comprising pillar means fixed to said second plate and projecting toward the first plate, each pillar means being formed with a transverse depression, said first plate and block having a perforation disposed to slidably receive said pillar means, and bolt means slidably carried by said block and having a tooth operative to engage said transverse depression of said pillar means to retain said plates in said operative position, the bolt means being displaceable to disengage the tooth from said depression to permit separation of said plates;

(c) a shaft rotatably supported by each block and passing adjacent to each bore, a pair of pinions mounted on each shaft and respectively extending into each bore and disposed therein to mesh with one of said toothed columns, the pinions being operative when rotated in a first locking direction to displace said first plate toward said second plate and being operative when rotated in a second unlocking direction to urge said first plate away from said second plate;

(d) release means carried by said shaft and operative to displace said bolt means to disengage said tooth from said depression when said shaft is rotated in said second unlocking direction; and

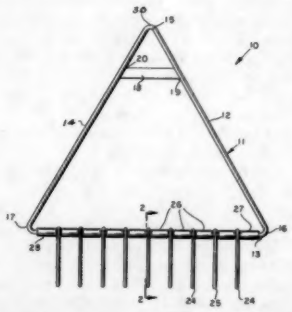
(e) lost-motion connecting means coupling said shaft and said pinions, said connecting means allowing said pinions a predetermined angle of freedom of rotation with respect to said shaft.

4,394,040

GRAPPLE

Richard Marzka, 6051 Knoyle Rd., Erie, Pa. 16510, assignor to Richard Marzka and Mark R. Krahe, both of Erie, Pa.

Filed Jul. 24, 1981, Ser. No. 286,610
Int. Cl.³ B66C *1/10*
U.S. Cl. 294—66 R **3 Claims**



1. Apparatus for grapple which comprises:

a relatively rigid frame (11),

said frame (11) being formed generally in the shape of a triangle having a first straight side (12), a second straight side (13) and a third straight side (14),

said first side and said third side being connected together at a first apex,

said first side and said second side being connected together at a second apex and said second and third sides being connected together at a third apex.,

said first apex being adapted to have a line attached thereto,

a plurality of hook members (24,25) swingably mounted on said second side (13), each said hook member having an elongated straight portion (23), an eye formed on one end of said elongated straight portion and a curved hook (24, 25) formed in the other end of said elongated straight portion, said eyes receiving said second side,

a plurality of tubular spacers (26) received on said second side (13), each said spacer being received on said second side between each two adjacent said eyes,

a cross member (18) extending from said first side adjacent said first apex and to said third side and attached to said first side and said third side,

each said hook member having its said curved hook extending in a different direction from the said hooks adjacent thereto,

said hook members terminating in an end portion extending generally parallel to said straight portion and terminating in a flat end.

4,394,041

HOISTING YOKE

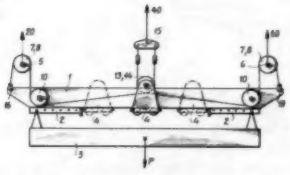
Jakob de Nachtegaal, Hendrik Ido Ambacht, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

Filed May 14, 1981, Ser. No. 263,605

Claims priority, application Netherlands, May 20, 1980, 8002900

Int. Cl.³ B66C *1/10*

U.S. Cl. 294—181 R **2 Claims**



1. A hoisting yoke for lifting and displacing a load, comprising an elongated frame, means at opposite ends of the frame for supporting the frame, suspension means intermediate the length of the frame displaceable lengthwise of the frame for sharing the load of the frame, and means responsive to unequal loading of said supporting means at the ends of the frame to move said intermediate means lengthwise of the frame until the loading at the opposite ends of the frame and at the intermediate means are all three equal.

4,394,042

ICE SKATE CARRIER

David H. Smith, 454 Barkentine La., Redwood City, Calif. 94065

Filed Apr. 19, 1982, Ser. No. 369,560

Int. Cl.³ B65D *71/00*

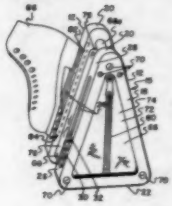
U.S. Cl. 294—163 **11 Claims**

1. In a portable, rigid carrier for a pair of ice skates including: an upright wall having a front side, a rear side, a pair of lateral panels having planar surfaces, a top and a bottom, the improvement comprising:

a central, longitudinal slit extending from lower portion to upper portion of said front and rear sides;

each of said lower portions provided with an adjustment means located in said slit comprising a plurality of pairs of opposite notches and a peg member removably insertable therebetween;

each of said upper portions of said front and rear sides provided with a spring-loaded locking means positioned between said panels;



said adjustment means and said locking means cooperating with each other for holding an ice skate blade in a fixed position in said carrier when said blade is inserted therebetween in said slit.

4,394,043

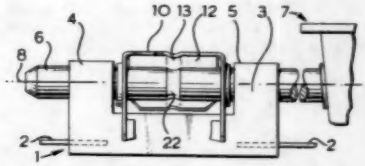
SUN VISOR

Michael B. Moulding, Hatfield Peverel, England; Klaus Müller, Weil-Haltingen, and Gerhard Mack, Rheinfelden-Adelhausen, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 15, 1981, Ser. No. 273,293

Int. Cl.³ B60J *3/00*

U.S. Cl. 296—97 H **6 Claims**



1. A sun visor comprising a mounting bracket having a longitudinally extending shaft projecting therefrom, a visor panel mounted on the shaft for rotation about the longitudinal axis of the shaft, and a mounting clip connected to the visor panel for rotation therewith and including a spring leaf which exerts a radial force on the shaft which resists rotation of the visor panel on the shaft, characterized in that the spring leaf and the shaft include complementary interengaging radial formations which engage each other to resist axial movement of the visor panel along the shaft.

4,394,044

REMOVABLE SUNROOF FOR VEHICLES

Louis E. Hough, 22448 Statler, St. Clair Shores, Mich. 48081; Walter J. De Vigili, 16082 Dugan Rd., Roseville, Mich. 48066, and David C. Shiffhett, 19466 Highlight Dr., Clinton Township, Clinton County, Mich. 48043

Filed Oct. 8, 1980, Ser. No. 195,150

Int. Cl.³ B60J *7/00*

U.S. Cl. 296—218 **29 Claims**

18. A sunroof assembly for a vehicle having an opening in the roof thereof, comprising:

a frame extending around the periphery of said opening;

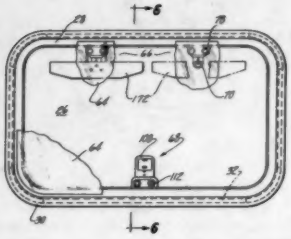
a compressible seal on said frame and extending around the periphery of said opening;

a sunroof panel adapted to overlie said opening in sealing engagement with said seal; and,

front and rear, spaced apart means for removeably mounting said panel on said frame and each including latch means for latching the front and rear of said panel in an open, elevated position above said roof, said frame including

(1) a first generally planar section adapted to overlie the top of said roof surrounding the perimeter of said opening,

(2) a second section having a first surface extending downwardly and away from said first section at an oblique angle relative to said first section, and



(3) a third section disposed below said roof and having a second surface contiguous with said first surface extending inwardly and away from the perimeter of said opening, said first and second surfaces defining a channel, said second and third sections including a pair of opposed grooves in said first and second surfaces respectively, said compressible seal being disposed within said channel and conformingly engaging said first and second surfaces, said seal extending into said opposed grooves whereby to be held by said grooves within said channel.

4,394,045

SPORTSMAN SLING SEAT AND GAME HAUL

Jack B. Shaw, 2710 Bedford St., and Donald E. Shaw, 101 Merchant St., both of Johnstown, Pa. 15904

Filed Dec. 10, 1980, Ser. No. 214,992
Int. Cl.³ A47C *13/00*
U.S. Cl. 297—118 **3 Claims**

1. A multi-use sportman's implement comprising:

seat means for providing a seat for a user when suspended from a support;

sling means for supporting a user's arm when suspended from the neck of said user;

chest means for distributing towing forces across the chest of said user when used for towing game;

said seat, sling, and chest means comprising a trapezoidal-shaped member, fabricated of flexible material, having an upper base and a lower base, said upper base having a length approximating the width of a man's chest and said lower base having a length greater than said upper base length;

first and second strap means respectively disposed and stitched along said upper and lower bases and extending outwardly from a first side and a second side of said trapezoidal-shaped member, said strap means extending from said first side being continuous from said upper base to said lower base and stitched together distal from said first side to provide large and small loops, and said strap means extending from said second side being continuous from said upper base to said lower base and stitched together distal from said second side to provide large and small loops;

a flat belt slidably receivable through said small loops, said belt adjustably attachable to said support when using said implement as a seat, and to said game when using said implement for game towing such that said user's arms are respectively inserted through said large loops of said first and second sides with said chest means against said user's chest and each of said first strap means across a shoulder of said user to suspend said chest means; and

said large loops passable over said user's head to suspend said sling means from said neck when said implement is used as an arm sling.

4,394,046

CONVERTIBLE ROCKER AND HIGH CHAIR

Warren W. Irwin, and Greg W. Irwin, both of 1330 Bluegrass Rd., Vista, Calif. 92083

Filed Jun. 26, 1981, Ser. No. 277,628
Int. Cl.³ A47C *3/02*
U.S. Cl. 297—132 **6 Claims**

1. A convertible rocker and high chair comprising:

a chair having a back, arms, and a rigid seat,

a skirt depending from the sides of the seat and having a front section and a rear section,

two pairs of inner and outer centrally pivoted cross arms pivotally mountable at their upper ends to the chair skirt,

two pairs of inner and outer centrally pivoted cross legs curved on their under sides to form rockers when the chair is lowered,

the cross legs being pivotally mounted at their upper ends to the lower ends of the cross arms to form a doubly extendable mechanism for raising and lowering the chair,

transverse rungs connecting opposite pairs of cross legs and cross arms at their pivot points,

the front section of the skirt having a cam aperture with internal cam surfaces,

a control rung connecting the upper ends of the inner cross arms and passing through the cam aperture for controlling the extension of the chair,

means for securing the control rung within the cam aperture to lock said chair in its upper or lower configuration.

4,394,047

SEAT BACK MOUNTING SYSTEM

Rene J. Brunelle, Wolcott, Conn., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 1, 1981, Ser. No. 269,157
Int. Cl.³ A47C *1/027*
U.S. Cl. 297—361 **3 Claims**

1. A mounting system for a back rest of a multi-passenger vehicle seat comprising a pivotable support element carried by

a seat base frame; said pivotable support element having the back rest pivotally attached thereto so as to permit approximately 90° of frictionally restrained movement of the back rest relative to the pivotable support element in a forward, vertical to horizontal path in response to the application of a relatively large force to the seat back; an actuating link for transmitting pivotal reclining motion of said pivotal support element and said back rest to a generally axially movable portion of a recline lock assembly carried by the seat base frame, said actuating link being pivotally mounted at its respective ends to said pivotal support element and to said axially movable portion of said recline lock assembly, said actuating link being mounted intermediate its ends to said pivotal support element so as to permit a small degree of frictionally restrained movement relative to said pivotable support element, said small degree of frictionally restrained movement being instituted by the application of a force to the seat back which is considerably smaller than the force required to move said back rest relative to said pivotable support element.

4,394,048

INTERLOCKING MECHANISM OF BOTH SIDE LOCK RECLINER FOR AUTOMOTIVE SEAT

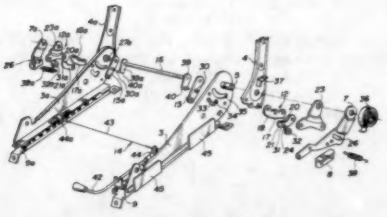
Kenji Sakurai, Toyota, and Noboru Yoshimura, Chiryu, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan

Filed May 11, 1981, Ser. No. 262,503

Claims priority, application Japan, May 16, 1980, 55/67107[U]

Int. Cl.³ A47C 1/026

U.S. Cl. 297—367 **4 Claims**



1. An interlocking mechanism of a both-side lock recliner for an automotive seat having a pair of right and left engaging mechanisms at both sides of the seat comprising:

an interlocking mechanism for simultaneously controlling the lock and the release of the right and left engaging mechanisms and including right and left manipulating levers and auxiliary levers provided symmetrically at both sides of the seat, and an interlocking rod including hooks formed at both ends thereof for engaging between the auxiliary levers of both sides,

said both-side manipulating levers rotatably secured to right and left side hinge shafts secured to right and left side lower arms, respectively at the outside of the lower arms,

said both-side auxiliary levers and the interlocking rod rotatably secured to the right and left side hinge shafts secured to the right and left side lower arms, respectively at the inside of the lower arms,

said both-side manipulating levers so connected as to be integrally rotated with the respective auxiliary levers through right and left side pins, respectively,

said interlocking rod connected to both-side auxiliary levers at the hook ends provided at the positions separate from the rotating coaxial centers thereof.

4,394,049

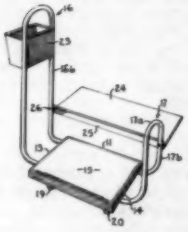
KNEELING AID DEVICE

Fred A. Ward, R.R. #1, Cairo, Mo. 65239

Filed Jun. 30, 1980, Ser. No. 164,310

Int. Cl.³ A47C 9/12

U.S. Cl. 297—439 **3 Claims**



1. A kneeling device, comprising, in combination:

(a) a rigid, normally horizontal frame having upper and lower sides thereto and of greater width than depth, whereas to have substantially forward, rear and side edges,

(b) a pair of normally substantially vertical bail members rigidly connected to said frame and positioned with one bail adjacent each side edge thereof in opposition to one another, leaving subsubstantial space therebetween for a person to kneel on the upper surface of the frame therebetween without being in contact with either bail when kneeling,

(c) upper portions of each of said bail members positioned substantially above the frame and having substantially horizontally oriented portions thereof adapted for grasping, each by one hand of a user of the device, in kneeling down thereon on rising up therefrom,

(d) one of the bail members having a substantially relatively higher grasping portion to be grasped by one hand of the user and the other of the bail members having a substantially relatively lower grasping portion to be grasped by the other hand of the user, said grasping portions being said substantially horizontally oriented upper portions of said bail members,

(e) the said relatively lower grasping portion of said one bail member so positioned and located in height as to require the initially standing user to lean or stoop to grasp same with one hand and to bear a preponderance of the user's weight and relatively more substantially support the user when the user, grasping both said bail grasping portions with separate hands, is substantially down in kneeling position or beginning to rise therefrom to a standing position,

(f) the said relatively higher grasping portion of the other bail so positioned and located in height as to not require the initially standing user to stoop to grasp same with the other hand and to bear a preponderance of the user's weight and relatively more substantially support the user,

when the user, grasping both said portions with separate hands, is beginning to kneel downwardly to the frame upper surface from a standing position or has substantially risen upwardly from the frame upper surface to a standing position,

(g) two supporting leg members fixed to the underside of the frame and extending normally downwardly therefrom adapted to support the frame in a horizontal position spaced upwardly from a substantially horizontal supporting surface, said leg members being positioned closely adjacent the side edges of the frame, normal to the width axis thereof and extending substantially the depth thereof,

(h) one of the bail members being of substantially greater height than the other, the said relatively higher bail grasping portion and relatively lower bail grasping portion comprising the uppermost parts of the respective bail members and

(i) a pair of wheels rotatably mounted next to the side edges of the frame having the highest bail member thereat on the underside of the frame and outboard of the supporting leg member at that side of the frame,

(j) the two supporting leg members fixed to the underside of the frame being of greater height than the downward extension of the wheels below said frame,

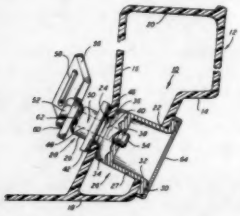
whereby the frame may be tilted off the supporting leg members onto the said wheels by grasping the the higher bail member at the top thereof and tilting the frame at an angle to the supporting surface.

4,394,050

APPARATUS FOR SECURING AN ARTICLE TO A PLASTIC FRAME-LIKE STRUCTURE

Colin R. Spooner, Norfolk, England, assignor to Delorean Research Limited Partnership, Bloomfield Hills, Mich.

Filed Mar. 11, 1981, Ser. No. 242,469
Int. Cl.³ A62B *35/00*
U.S. Cl. 297—468 **12 Claims**



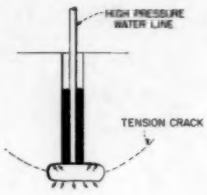
1. Apparatus for securing an article to a plastic structure, the plastic structure including two spaced and adjacently disposed frame-like members each having an opening therein, the apparatus comprising a first mounting member having a first portion of increased perimeter which is greater than the perimeter of the opening in one of the frame-like members, said first mounting member being adapted to extend into the opening in the one frame-like member with the first portion being adapted to engage the one frame-like member adjacent the opening therein on an exterior side thereof, a second mounting member having a second portion of increased perimeter which is greater than the perimeter of the opening in the other of the frame-like members, said second mounting member being adapted to extend into the opening in the other frame-like member with the second portion engaging the other frame member adjacent the opening therein on an exterior side thereof, said first mounting member including another portion adapted to engage an interior side of said other frame-like member, at least one of said first and second mounting members including means for spacing said second portion of said second mounting member and said other portion of said first mounting member, and means for connecting said first and second mounting members together to engage them in the plastic structure with said second portion of said second mounting member and said other portion of said first mounting member spaced by said spacing means and oppositely disposed, said second mounting member including means for receiving said article.

4,394,051

METHOD OF HYDROSPALLING

Martin S. Oudenhoven, Lakewood, Colo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 3, 1981, Ser. No. 270,038
Int. Cl.³ E21C *37/06*
U.S. Cl. 299—16 **5 Claims**



1. A method of hydrofracturing in situ rock material from its free surface when the material's tensile strength is much less than its compressive strength comprising the steps of:

(a) forming a small diameter hole no more than 1 inch in diameter to a predetermined depth in the material to be fractured;

(b) cutting a generally circular slot in the material from near the bottom of the hole formed in step a, said slot extending outwardly from the hole and encircling it;

(c) mounting and inflating an elongated packer assembly having a fluid conduit therethrough in the hole, said packer terminating at its end remote from the hole's entrance near the intersection of the hole with the slot formed in step b; and

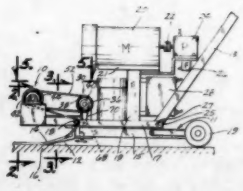
(d) injecting a fluid under high pressure into said slot's volume through the conduit in the packer assembly to fracture the material with the fracture beginning at or near the periphery of the slot and extending to the material's free surface.

4,394,052

CARPET TAKE-UP DEVICE AND METHOD FOR USING THE SAME

Edgar L. Adams, 1516 E. 29th St., Des Moines, Iowa 50317, and William D. Ludington, R.R. 1, Carlisle, Iowa 50047

Filed Jul. 16, 1981, Ser. No. 283,997
Int. Cl.³ A47L *11/12*; B65H *75/02*
U.S. Cl. 299—18 **11 Claims**



1. A carpet take-up device for removing carpet from a supporting surface, said device comprising:

a frame having forward and rearward ends;

a spool mechanism rotatably mounted on said frame for

rotation about a horizontal axis, said spool mechanism being adapted to retentively receive a loose end of said carpet,

a means for rotating said spool mechanism,

a blade adapted to wedge beneath said carpet, and having opposite longitudinal ends,

a rear support wheel,

a roller bar rotatably mounted to said frame behind and below said spool mechanism and behind and above said blade, and

said loose end of said carpet passing above said blade, behind and around said roller bar and being connected to said spool mechanism such that rotation of said spool mechanism causes said blade to be pulled forward beneath said carpet to free said carpet from said supporting surface.

4,394,053

NOZZLE HOLDER FOR CUTTER DRUM IN LONGWALL MINING MACHINERY

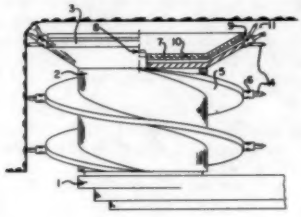
Herbert Schupphaus, Bochum, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Nov. 24, 1981, Ser. No. 324,529

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044874

Int. Cl.³ E21C *35/22, 27/24*

U.S. Cl. 299—81 **8 Claims**



1. In a cutter drum having a cutter drum body rotatably mounted on a shaft and a nozzle holder non-rotatably mounted on said shaft in a location corresponding to the end face of said drum body,

said nozzle holder being equipped with nozzles distributed over its periphery,

said nozzles being adapted to form, in the mineral to be loosened with the use of said drum, a spray pattern extending over the peripheral portion of said drum body facing the material being mined,

a plurality of cutter picks carried on said drum body at said end face thereof,

said picks projecting beyond said end face of said drum body and being dimensioned and positioned such that when said drum body is rotated about said shaft and said nozzles are fed to form jets of water, the picks will intersect with said jets to produce a pulsating effect.

4,394,054

PLAY-FREE HOOK-TYPE CONNECTION

Gerrit Nieboer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 1, 1980, Ser. No. 211,551

Claims priority, application Netherlands, Dec. 19, 1979, 7909125

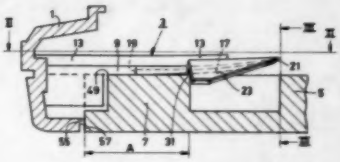
Int. Cl.³ G12B *9/00*; A47B *81/06*

U.S. Cl. 312—7.2 **8 Claims**

1. A hook-type connection for the play-free connection of a first part to a second part, the hook-type connection comprising:

a flexible hook with a shank and at least one wing mounted on said shank, said shank connected to said first part having a pressure edge, and

an abutment which is connected to said second part having an abutment edge with which said pressure edge cooperates, at least one of the two edges enclosing an acute angle with a plane which extends substantially perpendicularly of the longitudinal direction of said shank of said hook,



said hook being locally structurally weakened in the longitudinal direction of said shank when a torque is exerted on said shank by at least said one wing which forms part of said hook and which is connected to said shank adjacent the end which is remote from said first part, said wing having an edge which faces said first part and comprises said pressure edge.

4,394,055

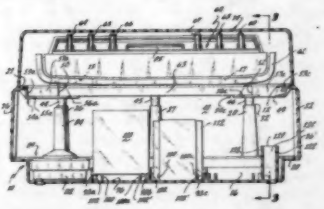
CABINET FOR VIDEO GAME CONSOLES, CARTRIDGES, ACCESSORIES, AND INSTRUCTION BOOKLETS

Richard D. Smith, 28640 Vista Madera, San Pedro, Calif. 90732

Filed Aug. 13, 1981, Ser. No. 292,352

Int. Cl.³ A47B *47/00, 81/06*

U.S. Cl. 312—196 **10 Claims**



1. As an article of manufacture a cabinet for holding video game playing equipment including control consoles and accessories, said cabinet having a top having an opening in it, the periphery of the opening being constructed to provide supporting surfaces for accommodating a plurality of different control consoles having varying configurations, said opening having portions whereby to provide support surfaces and means forming additional support surfaces at said opening which are positioned whereby the said support surfaces can accommodate control consoles having a base portion of smaller dimensions which can extend through said opening to be supported on said additional surfaces, the said cabinet having a lower section constructed for holding accessories, said opening has portions of different width than other portions, said other portions being constructed to accommodate a control console having a base part of a size to be accommodated to be received in the said opening at the position of said other portions, said opening includes inwardly extending ledges having portions extending inwardly from the ends of the said opening, to accommodate a console having a base part extending into the opening, said opening has narrower end portions which form shoulders in the said top between the opening portions, the said ledges including portions extending inwardly

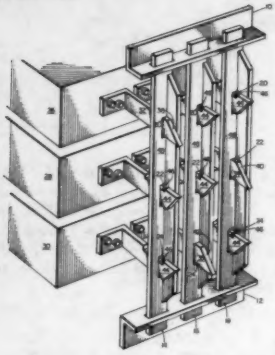
from said shoulders, providing a rectangular configuration to receive and hold a narrower base portion of another console.

4,394,056

DRAWER LOCKING MECHANISM

Elden W. Janke, Valencia, Calif., assignor to Teradyne, Inc., Boston, Mass.

Filed Feb. 11, 1981, Ser. No. 233,557
Int. Cl.³ E05B 65/46; E05C 15/04
U.S. Cl. 312—216 7 Claims



1. Locking mechanism for a plurality of vertically oriented horizontally reciprocal members which comprises

a first member of said members,

a second member of said members,

a first vertically limitedly reciprocable locking bar,

a second vertically limitedly reciprocable locking bar,

first camming means carried by said first member for cooperation with said first vertically limitedly reciprocable locking bar to provide first vertical movement of said first vertically limitedly reciprocable locking bar when said first member is moved away from said first vertically reciprocable locking bar,

second camming means carried by said second member for cooperation with said second vertically limitedly reciprocable locking bar to provide second vertical movement of said second vertically limitedly reciprocable locking bar when said second member is moved away from said second vertically reciprocable locking bar,

first latch means carried by said first member for cooperation with said first vertically limitedly reciprocable locking bar to prevent horizontal movement of said second member upon said first vertical movement, and

second latch means carried by said second member for cooperation with said second vertically limitedly reciprocable locking bar to prevent horizontal movement of said second member upon said second vertical movement.

4,394,057

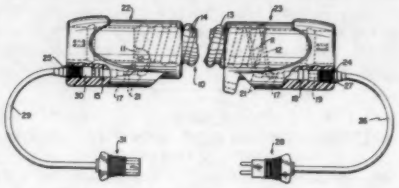
DOUBLE-MOLDED ELECTRICAL END FITTING ASSEMBLY

James Williams, Abbeville, and Henry K. Wills, Greenwood, both of S.C., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed Apr. 15, 1981, Ser. No. 254,435
Int. Cl.³ H01R 35/00
U.S. Cl. 339—15 2 Claims

1. In combination with a flexible hose having a pair of electrical conductors extending throughout its length, a first outer fitting molded about one end of the hose and having a first recess at its extremity, a first removable electrical harness having a male connector end insertable in the first recess of the first molded fitting, a second outer fitting molded about the other end of the hose and having a second recess at its extremity, a second removable electrical harness having a female connector end insertable in the second recess of the second molded fitting, the improvement which comprises:

(a) a female connector with dual insulated wires molded and enclosed entirely within the first outer fitting, a female plug being included therein and accessible within the first recess of the first outer fitting to receive the male connector of the first harness, said dual wires being electrically connected to said pair of electrical conductors of the hose; and



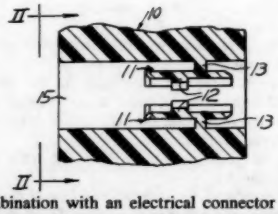
(b) a male connector with dual insulated wires molded and enclosed entirely within the second outer fitting, a male plug being included therein and accessible within the second recess of the second outer fitting to receive the female connector of the second harness, said dual wires being electrically connected to said pair of electrical conductors of the hose.

4,394,058

ELECTRICAL CONNECTOR INSERT ASSEMBLY

David L. Frear, Afton, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 30, 1981, Ser. No. 279,139
Int. Cl.³ H01R 13/42
U.S. Cl. 339—59 R 8 Claims



1. In combination with an electrical connector having removable contacts said connector of the type having: a housing; a plurality of contacts, each contact having a rear portion, a forward mating portion, and an annular groove between said forward and rear portions, and means for releasably mounting said contacts in said housing including an insert having a plurality of bores therein, each bore having therein a portion of a respective contact having the annular groove therein and a contact retention member, the improvement wherein said contact retention member comprises:

an arcuate segment having forward and rear ends spaced from the wall of said bore and on the inside thereof an inwardly projecting shoulder engaging the annular groove in a respective contact, and on the outside thereof between said ends, means for pivotally mounting to said insert the arcuate segment in each bore so that either end of said arcuate segment may be deflected to disengage the projecting shoulder from the groove in the contact whereby, a tool may be inserted into a bore in said insert

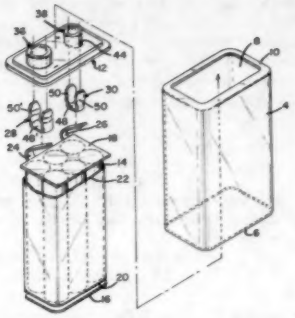
to engage and pivot said arcuate segment in said bore so that the projecting shoulder of the segment disengages from the groove in the contact thereby releasing the contact in said bore for removal from the connector.

4,394,059

CONNECTOR OF A TYPE USED WITH DRY CELL BATTERIES AND MANUFACTURING METHOD

Charles E. Reynolds, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 3, 1981, Ser. No. 289,443
Int. Cl.³ H01M 2/04
U.S. Cl. 339—125 R **22 Claims**



1. A connector of the type comprising an insulating support having a snap fastener plug terminal and a snap fastener socket terminal on a first surface thereof, said snap fastener plug and socket terminals being dimensioned to be coupled to a complementary snap fastener socket terminal and a snap fastener plug terminal respectively on a similar connector, said connector being characterized in that:

said support comprises a molded thermoplastic member having an integral plug terminal supporting portion and an integral socket terminal supporting portion on said first surface,

said plug terminal and said socket terminal each being a one-piece stamped and formed sheet metal member having first and second contact portions, each of said terminals being partially inserted through said support so that the first contact portion of each terminal is on said first surface of said support and said second contact portion is on a second surface of said support which is oppositely directed with respect to said first surface,

said first contact portion of said plug terminal being against, and supported by, said plug terminal supporting portion, said first contact portion of said socket terminal being against, and supported by, said socket terminal supporting portion.

4,394,060

LIGHT BEAM SCANNING SYSTEM WITH SAW TRANSDUCER

Carl M. Verber, Columbus; Richard P. Kenan, Upper Arlington, and Richard Ridgway, Columbus, all of Ohio, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

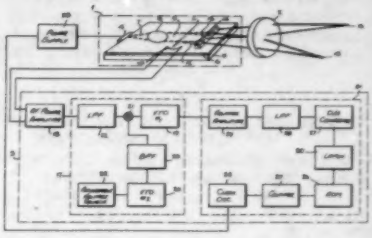
Filed Apr. 15, 1981, Ser. No. 254,470
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.13 **10 Claims**

4. A light beam scanning system comprising:

an optical waveguide;

SAW transducer means for generating surface acoustic waves in said waveguide; and

driving means for driving said SAW transducer means, said driving means comprising a varactor tuned oscillator and a digital linearization circuit for compensating for the



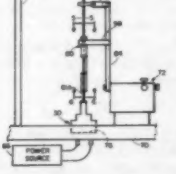
non-linearity of the frequency of said varactor tuned oscillator.

4,394,061

APPARATUS FOR ALIGNING AN OPTICAL FIBER IN AN LED PACKAGE

Scott L. Schroeder, Belmont, Calif., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Jan. 22, 1982, Ser. No. 341,722
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **18 Claims**



1. A ferrule for loosely-releasably supporting a filament over at least the major portion of a limited length thereof and holding the limited length of filament in a straight line so as to reduce bowing of the filament adjacent one end of the ferrule that is proximate the emitting surface of a light emitting element, said ferrule comprising:

an elongated member having a length between opposite ends thereof that extends in a prescribed direction along a given straight line and which corresponds to the limited length;

said member having a recess cut into the exterior surface thereof over the breadth thereof for defining first and second sections on opposite sides of the recess and at opposite ends of said member, the recess extending over a prescribed length which is much less than the limited length and having a depth that is at least equal to the distance between the given line and the perimeter of said member;

said first section having a first channel therein extending over the length thereof along the given line and being in front of the bottom of the recess so as to open into the recess, the first channel being dimensioned for receiving the largest filament to be supported and extending into said member to the given line; and

said second section having a second channel therein extending over the length thereof along the given line and being in front of the bottom of the recess so as to open into the recess, the second channel also being dimensioned for

receiving the largest filament to be supported and extending into said member to the given line;

the first and second channels overlapping along the given line sufficiently for receiving a filament therein, and being oriented in an end view of said member looking along the given line for forming an angle therebetween that is sufficient for receiving and holding a filament therein.

4,394,062

SPLITTABLE FIBER OPTICAL WAVEGUIDE AND METHOD OF MANUFACTURE

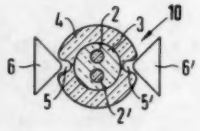
Hartmut Schneider, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich

Filed Feb. 25, 1980, Ser. No. 124,608

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1979, 2909356

Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.33 **9 Claims**



7. An optical device such as an optical directional coupler comprising a splittable optical fiber waveguide with a split portion, said waveguide having an outer surface and at least one fiber optical core being surrounded by a cladding material, said splittable waveguide having at least a pair of longitudinally extending indentations in an outer surface, each of said indentations having a substantial depth with a corresponding reduction in the thickness of the cladding at each indentation to create starting points for splitting wedges and to receive the splitting wedges and said split portion of the waveguide extending between the pair of indentations.

4,394,063

DEVICE FOR RECONSTRUCTING LAYER IMAGES OF A THREE-DIMENSIONAL OBJECT BY MEANS OF AN ADJUSTABLE IMAGING MATRIX

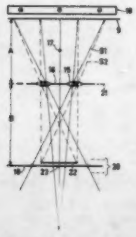
Hermann Weiss, Hamburg; Erhard Klotz, Halstenbek; Horst Peemöller, Hamburg; Rolf Linde, Haseldorf, and Wilfried Mauser, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, NY

Filed Nov. 17, 1980, Ser. No. 207,325

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946442

Int. Cl.³ G02B *5/32*; G03H *1/28*; A61B *6/02*

U.S. Cl. 350—162.13 **8 Claims**



1. A device for producing images of layers of a three-dimensional object from a coded image of the object, said coded image being a superposition of perspective images formed by irradiating the object from a large number of radiation source positions situated in one plane, said radiation source positions forming a distribution, said device comprising:

illumination means for irradiating the coded image;

a photosensitive element;

an imaging matrix comprising a number of imaging elements equal to the number of radiation source positions, said imaging elements being situated in a matrix plane in a distribution which is the same as or linearly proportional to the distribution of radiation source positions, said imaging matrix being illuminated, via the coded image, by the illumination means to form superposed perspective images of the object on the photosensitive element, the superposed perspective images producing an image of a layer of the object on the photosensitive element; and

means for changing the positions of the individual imaging elements in the matrix plane while maintaining the distribution of the elements linearly proportional to the distribution of radiation source positions, wherein images of different layers of the object are produced by changing the positions of the imaging elements.

4,394,064

DURABLE CERAMIC ENAMEL SPANDRELS

Samuel Dauson, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 30, 1981, Ser. No. 278,957

Int. Cl.³ G02B *17/00, 27/00*

U.S. Cl. 350—259 **6 Claims**

1. An article for use in curtainwall construction comprising:

a. a rigid panel substrate;

b. an opaque colored ceramic enamel coating fired on said substrate; and

c. a transparent, colorless, protective metal oxide film deposited over said ceramic enamel coating,

wherein the dominant wavelength of light reflected by said opaque ceramic enamel coating is not equivalent to the dominant wavelength of light transmitted by said transparent film.

4,394,065

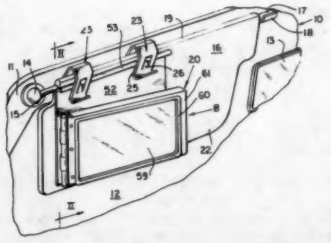
WINDSHIELD VISOR MIRROR

Arthur P. Swanson, 1454 Estate La., Glenview, Ill. 60025

Filed Sep. 21, 1982, Ser. No. 420,899

Int. Cl.³ B60R *1/08*

U.S. Cl. 350—304 **14 Claims**



1. A vehicle windshield visor mounted rear view mirror adapted to reflect to the vehicle driver the area in the traffic lane alongside the driver at the rear end of the vehicle, which comprises a mirror unit having a base, means for mounting the base against a face of a windshield visor and said unit having a mirror with an end adjacent the traffic lane hinged on the base to swing the mirror laterally of the visor face to reflect said area.

4,394,066

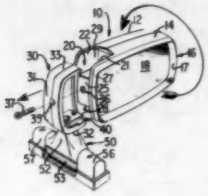
REVERSIBLE FLAG TYPE REAR VIEW MIRROR

Bernard C. Sharp, White Plains, N.Y., assignor to Parker Hannifin Corporation, Shelton, Conn.

Filed Oct. 24, 1980, Ser. No. 200,469

Int. Cl.³ B60R 1/06

U.S. Cl. 350—307 10 Claims



1. A rear view mirror head comprising a housing member of elongate generally polygonal shape, said member forming a frame for a mirror plate and being provided with a recess extending about and behind one end of said frame, and a substantially U-shaped saddle member fitting in said recess, said saddle member having means fixed thereto for joining said head pivotably with a mirror mounting bracket to be attached to a side of a vehicle body, said housing member and said saddle member respectively having connecting portions which confront in said recess and are joinable for fixing said members together with said housing member facing to either side of said saddle member so that the mirror head is assembleable for use on either the left side or the right side of a vehicle body.

4,394,067

DISPLAY DEVICE

Aloysius M. J. M. Spruijt, Eindhoven; Matheus A. T. Wijburg, Nijmegen; Gerardus C. M. Benschop, Nijmegen, and Hendrikus J. M. Vos, Nijmegen, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

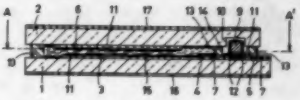
Filed Sep. 5, 1980, Ser. No. 184,562

Claims priority, application Netherlands, Sep. 7, 1979, 7906695

Int. Cl.³ G02F 1/133, 1/13

U.S. Cl. 350—334 19 Claims

1. A display device comprising two supporting plates separated by a space; a layer of liquid crystal in said space; a rim of sealing material between said two supporting plates and enclosing said layer of liquid crystal; a pattern of electrodes on one of said supporting plates facing said layer of liquid crystal; at least one further electrode on the other of said supporting plates facing said layer of liquid crystal; supply electrodes on said one supporting plate individually driving said pattern of electrodes; at least one non-encapsulated IC crystal accommodated in said rim of sealing material between said two supporting plates; contact pads of said IC crystal connected to said supply electrodes; and a number of external connection



electrodes connected to other contact pads of said IC crystal to be in communication with said supply electrodes.

4,394,068

FLUORESCENTLY ACTIVATED DISPLAY DEVICE WITH IMPROVED SENSITIVITY

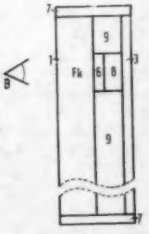
Heinz Pape; Ferdinand Quella, and Hans Krueger, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 14, 1980, Ser. No. 121,372

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1979, 2910952

Int. Cl.³ G02F 1/133, 1/19

U.S. Cl. 350—345 40 Claims



1. A device for the optical display of information with improved sensitivity and intensity comprising:

a plate consisting of a material with an index of refraction greater than 1 and which contains fluorescent particles for collection of light radiation impinging on said plate by means of fluorescent scattering;

a passive display having regions controllably switchable between a light absorbing and a light reflective state, said

passive display disposed behind said plate in the line of sight of a viewer; and

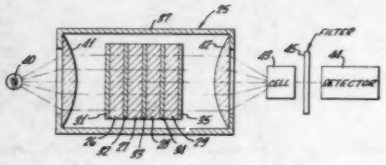
a coupling means for coupling selected areas of said plate and said passive display to allow transmission of light in selected patterns to a viewer.

4,394,069

LIQUID CRYSTAL TUNED BIREFRINGENT FILTER

Wilbur I. Kaye, Corona Del Mar, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 5, 1979, Ser. No. 45,725
Int. Cl.³ G02F 1/13
U.S. Cl. 350—347 E **10 Claims**



1. A tunable optical filter comprising:

a plurality of polarizers spaced at intervals along a propagation axis, each polarizer being characterized by a plane of polarization;

a plurality of birefringent elements spaced along the propagation axis within the intervals between the polarizers, any two birefringent elements being separated by at least one polarizer, each birefringent element having an optic axis oriented so that the plane defined by the optic axis and the propagation axis forms a 45° angle with the plane of polarization of each of the two polarizers immediately adjacent to and on opposite sides of that birefringent element, and at least one of the birefringent elements comprising a liquid crystal cell whose optic axis changes in response to a voltage applied to the cell;

means for controllably tuning the filter to a selected wavelength by applying to each liquid crystal cell a voltage corresponding to the selected wavelength so that each birefringent element will produce a relative phase shift equal to a multiple of 180° between the ordinary and extraordinary orthogonally polarized components of a light ray having the selected wavelength propagating along the propagation axis;

wherein each birefringent element is characterized as operating at a particular order, the order of an element being defined as the quotient obtained by dividing 360° into said relative phase shift equal to a multiple of 180°; and

wherein said filter includes eight birefringent elements, having orders of 1, 1, 2, 3, 4, 5, 8 and 13, respectively.

4,394,070

HELICHROMIC COMPOUNDS AND DISPLAYS

Harvey A. Brown, Lake Elmo, and William A. Huffman, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 169,275, Jul. 16, 1980. This application Jun. 22, 1981, Ser. No. 274,184
Int. Cl.³ G02F 1/13; C09K 3/34
U.S. Cl. 350—349 **33 Claims**

1. A composition consisting essentially of a nematic liquid crystal material and, in admixture therewith, an organic, nonionic, nonliquid-crystalline helichromic compound, said helichromic compound being soluble in said nematic liquid crystal material, and said helichromic compound being a dichroic dye and having the general formula

$$Q\text{-}(Z)_n$$

wherein:

Q is a radical selected from the group consisting of azo, azo-stilbene, benzothiazolyl polyazo, methine, azomethine, merocyanine and methine arylidene radicals;

Z is an organic group capable of imparting helical ordering characteristics to said mixture of nematic liquid crystal and helichromic compound; and

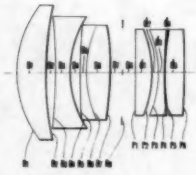
n is an integer having a value of 1 or greater.

4,394,071

LENS SYSTEM WITH FILL-IN LENS

Yasuyuki Yamada, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1981, Ser. No. 296,649
Claims priority, application Japan, Sep. 3, 1980, 55-122179
Int. Cl.³ G02B 9/62, 15/02
U.S. Cl. 350—422 **1 Claim**



1. A lens system having a main photo-taking lens and a fill-in lens lying in between said main photo-taking lens and the image plane and detachable therefrom, and having the following various conditions:

said fill-in lens having, from front to rear, a positive 1st lens, a negative 2nd lens and a positive 3rd lens;

letting n_1 and ν_1 denote the refractive index and Abbe number of the glass of said positive 1st lens respectively, r_5 the radius of curvature of the front surface of said positive 3rd lens, d_5 the axial thickness of said 3rd lens, n_3 and ν_3 the refractive index and Abbe number of the glass of said 3rd lens respectively, and f the overall focal length of said main photo-taking lens and said fill-in lens attached thereto, the following relationships are fulfilled:

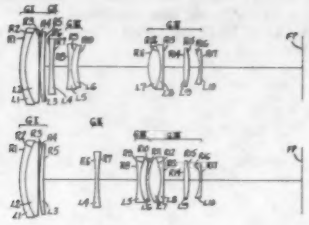
(1) $0.3 < r_5/f < 0.6$
(2) $0.02 < d_5/f < 0.08$
(3) $1.5 < n_1 < 1.7$
(4) $30.0 < \nu_1 < 50.0$
(5) $1.45 < n_3 < 1.75$
(6) $45.0 < \nu_3 < 85$

4,394,072

ZOOM LENS

Ellis I. Betensky, New York, N.Y., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Dec. 5, 1980, Ser. No. 213,611
Int. Cl.³ G02B 15/18
U.S. Cl. 350—427 10 Claims



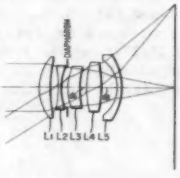
1. A zoom lens comprising from the object end a first positive group, a second negative group, a third negative group, and a fourth positive group, said second group being a singlet and the absolute value of the ratio of the power of said second group to said first group is less than 1.75, said fourth group from the object end comprising a positive doublet followed by a positive lens and a negative lens.

4,394,073

COMPACT WIDE ANGLE LENS

Koichi Wakamiya, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 10, 1980, Ser. No. 214,887
Claims priority, application Japan, Dec. 28, 1979, 54-1721198
Int. Cl.³ G02B 9/60
U.S. Cl. 350—465 6 Claims



1. A compact wide angle lens system having an angle of view of 60°–70° and a total length as short as the total focal length, f, of the lens system, comprising, in succession from the object side, a first positive meniscus lens component having its convex surface facing the object side, a second biconcave lens component, a third positive lens component having its surface of sharper curvature facing the object side, a fourth positive lens component, and a fifth negative meniscus lens component having its convex surface facing the image side, the lens system satisfying the condition:

$$0.51f < f_4 < 1.38f$$

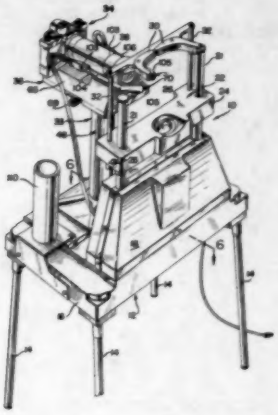
where f_4 represents the focal length of said fourth component.

4,394,074

FIBEROPTIC-LIGHTED OPTICAL APPARATUS

William McMahon, 14102 Willow La., Westminster, Calif. 92683, and Bernard Jensen, Rte. 1, Box 52, Escondido, Calif. 92025

Filed Sep. 22, 1980, Ser. No. 189,154
Int. Cl.³ A61B 3/10
U.S. Cl. 351—206 10 Claims



1. A fiberoptic-lighted optical apparatus for use with a camera for photographing the surface of the eye of a subject, wherein the apparatus comprises:

a housing structure;

means on said housing structure to support and position the subject's head with respect to said camera;

means for mounting and adjusting said camera with respect to the eye of said subject;

dual-light-source means adapted to be activated by the operation of said camera;

a light-transfer medium adapted to receive light from said dual-light source, and project said light remotely therefrom to illuminate said eye of said subject;

said dual-light-source means comprising:

a first light source; and

a second light source, wherein said second light source is positioned in front of and adjacent said first light source, whereby both of said light sources can be transmitted singularly or simultaneously through said light-transfer medium; and

means for individually activating said first light source separately from said second light source, when said second light source is not required;

said light-transfer medium comprising:

a first bundle of light-transmitting fiberoptic strands; and

a second bundle of light-transmitting fiberoptic strands, said strands being positioned adjacent each other, and in adjustable alignment with said first and second light sources, each bundle including a light-receiving end and a light-projecting end, said light-projecting end of each bundle being respectively positioned adjacent opposite sides of the lens of said camera;

means for selectively positioning said light-receiving end of said light-transmitting bundles in front of said dual-light-source means to selectively transmit light to one side or the other of said subject's eye.

4,394,075

SUPPORT APPARATUS

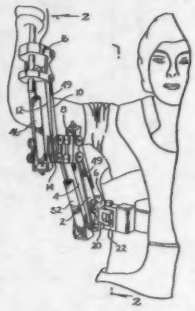
Garrett Brown, 508 Pine St., Philadelphia, Pa. 19106, and Arnold O. Di Giulio, 4522 Woodman Ave., Sherman Oaks, Calif. 91423

Continuation of Ser. No. 700,544, Jun. 28, 1976, Pat. No. 4,208,028, which is a continuation-in-part of Ser. No. 506,326, Sep. 16, 1974, Pat. No. 4,017,168. This application Jun. 16, 1980, Ser. No. 159,657

The portion of the term of this patent subsequent to Jun. 17, 1997, has been disclaimed.

Int. Cl.³ G03B *17/00*

U.S. Cl. 352—243 7 Claims



1. A weight support apparatus system especially adapted for operation as a portable device on a moving carrier and capable of being guided by the arm of an operator which comprises:

weight support means comprising first and second ends, the first end being connected to and adapted to support at least part of the weight, the second end being connected to the carrier,

said weight support means comprising at least a pair of first and second interconnected support arms, said support arms being adapted to damp out vibrations due to movement of the carrier,

each of the support arms comprising an upper and a lower longitudinal link and a medial bracket, which upper and lower links and medial brackets respectively form legs of a parallelogram, the respective upper and lower links and the medial bracket of each arm being pivotally interconnected to permit vertical rotative movement of one arm relative to the other, the first and second support arms each comprising respectively a first resilient means and a second resilient means, the first and second resilient means continuously biasing respectively the ends of the support arms that are remote from the carrier upwardly relative to the carrier, the bias of the first and second resilient means being substantially balanced by the weight, the first and second resilient means being connected respectively across the parallelograms to damp out vibrations caused by movement of the carrier and to cause the weight to free-float irrespective of movement of the carrier,

said weight support means substantially freeing the operator's hands from the weight and capable of being guided to a desired position selected by the operator; and

rotatable hinge bracket means interconnecting the medial brackets of the support arms, the hinge bracket means comprising a vertical pivot pin to permit horizontal rotatable movement of one arm relative to the other,

whereby the weight is isolated and free-floating at a distance from the operator substantially independent of any unwanted lateral and vertical vibrations caused by motion of the carrier.

4,394,076

INDICIA RECORDING APPARATUS

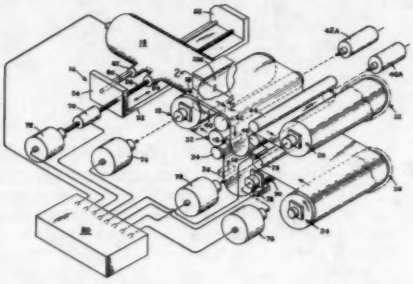
Solomon Manber, Sands Point; David Chiang, Dix Hills, and Mosi Chu, Setauket, all of N.Y., assignors to Amtech Patent Licensing Corp., No. Miami Beach, Fla.

Continuation of Ser. No. 173,966, Jul. 31, 1980, Pat. No. 4,310,226. This application Jul. 10, 1981, Ser. No. 282,279

The portion of the term of this patent subsequent to Jan. 12, 1998, has been disclaimed.

Int. Cl.³ B41B *21/08;* G01D *9/38;* H04I *15/34*

U.S. Cl. 354—5 12 Claims



12. Indicia recording apparatus comprising: a source of a record medium; an accepting means for accepting record medium removed from said source; a supporting means intermediate said source and said accepting means, for supporting a portion of the record medium, a carriage means controllably and repeatedly movable opposite said supporting means and in a direction transverse to the travel of the record medium, and a recording head on said carriage means, said recording head comprising radiation emitting means for emitting intensity modulated radiation toward said supporting means along a plurality of equilength scan lines, each of said scan lines being in a different plane intersecting said supporting means whereby during a single traverse of said carriage means a transverse band of the record medium is scanned.

4,394,077

DEVICE FOR DETECTING SHARP FOCUSING

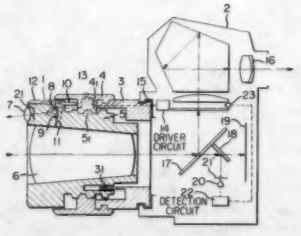
Tsunemi Yoshino, Ibaraki; Toshitsugu Kashihara; Hiroshi Iwata, both of Nara, and Akitoshi Morioka, Osaka, all of Japan, assignors to West Electric Co., Ltd., Osaka, Japan

Filed Oct. 21, 1981, Ser. No. 313,668

Claims priority, application Japan, Oct. 27, 1980, 55-150527

Int. Cl.³ G03B *13/18, 15/05*

U.S. Cl. 354—25 8 Claims



1. An image focusing device characterized by comprising a light beam projection means which is disposed within a photographic lens, whose optical axis is contained in the same plane which contains the optical axis of said photo-

graphic lens and which can project the light beam toward an object,

a lens-group displacement detection means which is disposed within said photographic lens and which can respond to the axial displacement of said photographic lens for focusing the object so as to cause said light-beam projection means to change the light-beam projection direction,

a photodetection means which is disposed within a camera body at such a position spaced apart from a main mirror by the same distance between the mirror and the film plane at which said photodetection means can intercept the light beam passing through said photographic lens along the optical axis thereof and at which said photodetection means will not interfere with the formation of the image of the object through said photographic lens upon a film plane,

a driver-control means which includes an actuating switch and which, upon closure of said actuating switch, can drive said light-beam projection means, and

a detection circuit which drives a display means responding to the output from said photodetection means to detect whether or not said photographic lens is sharply and correctly focused at the object.

4,394,078

METHOD OF CONTROLLING EXPOSURE

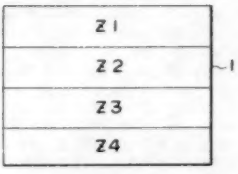
Takaaki Terashita, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 2, 1980, Ser. No. 193,155

Claims priority, application Japan, Oct. 3, 1979, 54-127655

Int. Cl.³ G03B *7/08*

U.S. Cl. 354—31 **1 Claim**



1. A method of controlling exposure for a camera based on the scene brightness measured by light measuring elements comprising the steps of;

dividing a light measuring area in a camera into a plurality of zones,

providing at least one light measuring element in each of said zones,

obtaining the maximum or minimum brightness (Bzi) in each of said zones,

obtaining an average brightness (B_0) from the outputs of all the light measuring elements provided in said light measuring area,

obtaining a weighted sum of the brightness based on a formula of

$$\sum_{i=1}^{n} K_{1+2}$$

where K_{i+2} is a coefficient and n is the number of the zones,

computing a scene brightness (B) by use of a formula of

$$B = K_1 + K_2 \cdot B_0 + \sum_{i=1}^{n} K_{1+2} Bzi$$

where K_1, K_2, K_{i+2} are coefficients, and

controlling exposure of the camera based on the scene brightness (B).

4,394,079

PHOTOGRAPHIC FLASH DEVICE OPERATIVELY RESPONSIVE TO THE LUMINANCE OF AN OBJECT TO BE PHOTOGRAPHED TO PREVENT OVEREXPOSURE

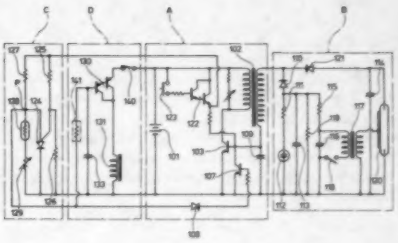
Yoshiyuki Takematsu, Tokyo, Japan, assignor to Fuji Koeki Kabushiki Kaisha, Tokyo, Japan, a part interest

Filed Jun. 23, 1981, Ser. No. 276,510

Claims priority, application Japan, Jun. 26, 1980, 55-85953; Jul. 18, 1980, 55-97571

Int. Cl.³ G03B *15/03*

U.S. Cl. 354—33 **12 Claims**



9. A photographic flash device operatively responsive to the luminance of an object to be photographed and for use with a camera including means for positioning a flash light device into a retracted, nonoperative position and into an extended, operative position, the photographic flash device comprising:

a DC power source;

charge storage means coupled to said DC power source for charging thereby;

means for triggering said flash light device when the charge level of said charge storage means exceeds a predetermined charge level;

means for detecting the luminance level of an object to be photographed and for inhibiting the charging of said charge storage means when the detected luminance level is greater than a predetermined luminance level; and

means for driving the positioning means to control the positioning of said flash light device in said operative position responsive to the detection of the luminance of the object to be photographed being less than said predetermined level and in said nonoperative position responsive to the detection of the luminance of the object to be photographed being greater than said predetermined level.

4,394,080

WINDING DEVICE FOR CAMERA

Hirovuki Kimura, Kawasaki, and Tateo Yamada, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 261,802, May 8, 1981, abandoned. This application Jul. 2, 1982, Ser. No. 394,506

Claims priority, application Japan, May 13, 1980, 55-63091; May 13, 1980, 55-63097

Int. Cl.³ G03B *1/12, 17/36*

U.S. Cl. 354—173 **13 Claims**

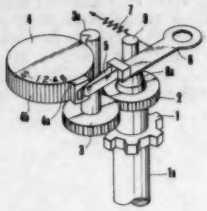
1. A winding device for a camera in which winding of a loaded film from a winding start position to an exposure start position is made automatically without interrelation to exposure operations, comprising:

display means for displaying the number of film frames exposed during exposure operations, said display means being rotatable in response to winding and rewinding of

the film and being restorable to an initial state before film winding by completion of film rewinding;

control means operative to automatically enable winding of loaded film, said control means being movably supported;

changeover means associated with rotation of said display means, said display means being in contact with said con-



trol means to maintain said control means operative while said display means displays the region from the winding start position to the exposure start position; and

displacing means for displacing said control means out of the operative zone of the changeover means, said displacing means operating in response to a rewind releasing operation.

4,394,081

MAGNETICALLY CONTROLLED SHUTTER

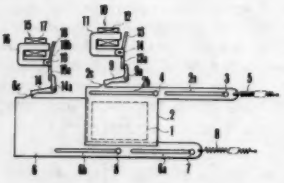
Teiji Hashimoto, and Syuichiro Saito, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1981, Ser. No. 292,733

Claims priority, application Japan, Aug. 28, 1980, 55-118607

Int. Cl.³ G03B 9/62

U.S. Cl. 354—234 **8 Claims**



1. A magnetically controlled shutter comprising: a leading shutter blind and a following shutter blind, a leading checking member for holding the leading shutter blind, a following checking member for holding the following shutter blind, and a leading electromagnet for controlling the leading shutter blind and a following electromagnet for controlling the following shutter blind, each acting on the respective checking members as power is supplied thereto for releasing a checking thereof, the electromagnet for controlling the following shutter blind having magnetic action characteristics different from those of the electromagnet for controlling the leading shutter blind, wherein said electromagnets are attraction type magnets, and wherein said electromagnets have respective yokes made of different magnetic substances.

4,394,082

SHUTTER FOR CAMERA

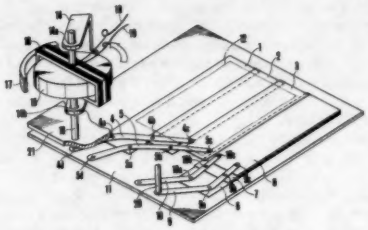
Michio Senuma, Tokyo, and Kunio Watanabe, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 16, 1981, Ser. No. 225,524

Claims priority, application Japan, Jan. 23, 1980, 55-6900[U]

Int. Cl.³ G03B 9/40

U.S. Cl. 354—246 **2 Claims**



1. A shutter for a camera comprising:

an opening for light to pass therethrough;

a plurality of shutter blades for opening and closing said opening for said light, said plurality of shutter blades comprising

(a) a plastic sheet

(b) a metal layer formed on both surfaces of said plastic sheet, said metal layer having a thickness of between 0.001 to 0.005 mm;

(c) a black coating on the surface of said metal layer;

(d) an embossed member for effecting connection with said shutter blades; and

(e) shutter driving members mounted on said embossed portions of each of said plurality of shutter blades so as to connect said shutter blades to each other, said members opening and closing said plurality of shutter blades.

4,394,083

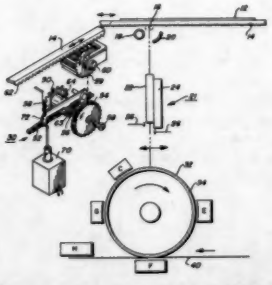
IMAGING SYSTEM FOR A MULTI-MAGNIFICATION COPIER UTILIZING GRADIENT INDEX LENS ARRAY

James D. Rees, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1982, Ser. No. 341,409

Int. Cl.³ G03B 27/00, 27/68

U.S. Cl. 355—1 **3 Claims**



1. An imaging system for a multi-magnification copier wherein a document on an object plane is reproduced onto a photosensitive image plane at a selected magnification, said system including:

a lens array assembly comprising a first gradient index lens array positioned between the object and image planes, to

transmit an image of said document onto said image plane first at a unity magnification,

a second gradient index lens array positioned between the object and image planes, said lens array adapted to transmit an image of said document onto said image plane at a second magnification m other than unity, said system further including:

means for preventing transmission of said document image through a selected one of said lens arrays whereby light reflected from said document is transmitted through said other array in the particular magnification onto the image plane,

illumination means placed beneath the object plane and adapted to provide a narrow illumination band of light along the bottom surface of the object plane so as to create a document scan exposure zone,

means for driving said document past said exposure zone, said driving means adapted to move the platen at a first rate associated with said unity magnification, a second rate associated with said second magnification and at least a third rate at one of said magnifications, said third rate resulting in an anamorphic magnification K of said document image at said imaging plane in the scan direction, and

means for moving the image plane at a process speed V

4,394,084

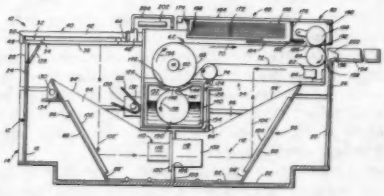
LOW-PROFILE ELECTROPHOTOGRAPHIC COPYING MACHINE

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Systems Corporation, Bedford, Mass.

Continuation of Ser. No. 11,309, Feb. 12, 1979, abandoned. This application Jul. 8, 1981, Ser. No. 281,305

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 BE **31 Claims**



1. A low-profile electrophotographic copying machine especially suitable for table top use comprising

an electrophotographic imaging belt mounted for rotational and horizontal movement on at least a pair of spaced rollers, to define a pair of substantially parallel horizontally oriented closely proximate upper and lower reaches, the lower reach of which is positioned to define an image plane, at least one of said rollers being driven, drive means for driving the said roller and producing rotational movement of said belt,

a charging station, including a corona generating device arranged adjacent the path of said belt for applying a charge potential thereto as the belt travels therepast and an exposure station located along the path of said belt downstream of said charging station whereat a light image is projected onto said charged belt to form an electrostatic latent image,

a horizontal copy platen arranged substantially parallel with and spaced from said electrophotographic belt generally at about the same level as said upper reach of said electrophotographic belt,

a folded optical projection station including a projection system for projecting light image of a document from the copy platen to said electrophotographic belt at said exposure station to form said electrostatic latent image on said lower reach of said belt at the image plane,

a development station located along the path of said belt downstream of said exposure station for developing said electrostatic latent image as the electrophotographic belt travels therepast,

a carrier medium supply and feed station, mounted above said electrophotographic belt whereby to dispense carrier medium to said belt subsequent to development of said electrostatic latent image on the belt,

and an image transfer station, including means for transferring said developed image onto said carrier medium after receipt of the carrier medium from said supply and feed station and delivering said carrier medium having said transferred image to the exterior of said machine, the upper reach of the electrophotographic belt being positioned proximate both said last mentioned two stations to provide for delivery of the carrier medium to said upper reach and the reception of said carrier medium by said upper reach, a housing for containing said electrophotographic imaging belt, said folded optical station, said developing station and said carrier supply station, said developing station being partially nested within said folded projection station, with said electrophotographic belt being located between and closely proximate to said developing station and said carrier medium supply station.

4,394,085

PROCESSING STATION FOR CHARGING, EXPOSING AND DEVELOPING PRINTING MASTERS

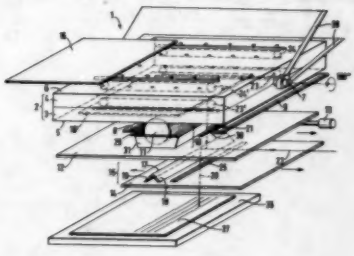
Werner Dennhardt, Bad Kreuznach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,482

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1980, 3047205

Int. Cl.³ G03G *15/00, 15/28*

U.S. Cl. 355—3 R **12 Claims**



1. A processing station for charging, exposing and developing printing masters, comprising an exposure table, at least one corona device, a developing unit and an optical scanning-exposure device; said exposure table being adapted to be rotated through 180° about a pin and comprising two superposed suction tables which are arranged in such a way that their suction plates form the topside and the underside of the exposure table.

4,394,086

PARTICLE CONTAINMENT APPARATUS

James M. Hoffman, Jr., Walworth, and Richard A. Lux, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1982, Ser. No. 361,695

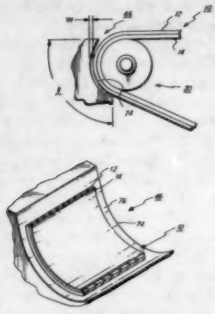
Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **10 Claims**

1. An apparatus for preventing particle contamination, including

a moving member;

a housing defining a chamber for storing the particles; and means, operatively associated with said housing, for defining a surface area extending in a direction substantially parallel to and spaced from said member with the length of the



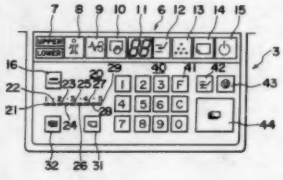
surface area parallel to said member being much greater than the space between the surface area of said defining means and said member so as to minimize air flow into and out of the chamber in said housing, thereby preventing the escape of particles from the chamber of said housing.

4,394,087

MECHANICAL ARRANGEMENT FOR CONTROLLING ELECTROPHOTOGRAPHIC APPARATUS

Yutaka Irie, Toyokawa; Kenzo Nagata, Okazaki, and Hideo Ito, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 4, 1981, Ser. No. 270,398
Claims priority, application Japan, Jun. 13, 1980, 55-80526
Int. Cl.³ G03G *15/00, 15/04*
U.S. Cl. 355—14 E **18 Claims**



1. A mechanical arrangement including a device to be controlled, an operational device for adjusting an active state of said controlled device through external operations and a control means for controlling the active state of said controlled device in response to operations of said operational device,

said operational device comprising:

indicating means for indicating changes in the active state of said controlled device stepwise;

UP operating means for increasing one step by one step an indication of said indicating means; and

DOWN operating means for decreasing one step by one step the indication of said indicating means;

said control means comprising:

means for changing the indication of said indicating means in response to operations of said UP operating means and said DOWN operating means and for changing the active state of said controlled device in accordance with the indication of said indicating means; and

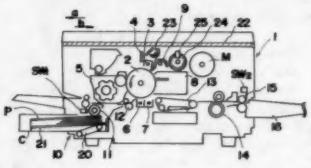
means for setting the indication of said indicating means and the active state of said controlled device to a predetermined standard value when said UP operating means and said DOWN operating means are operated simultaneously.

4,394,088

COPYING MACHINE

Hiroyuki Hanamoto, and Yoshihiro Horie, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Higashi, Japan

Filed Mar. 22, 1982, Ser. No. 360,426
Claims priority, application Japan, Mar. 27, 1981, 56-45811
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **10 Claims**



10. In an improved copying machine having means for recording an image, means for developing an image, means for storing copy paper, a copy paper transportation system for translating copy paper to receive the developed image, to fix it to the copy paper and to position it for removal from the copy machine, means for moving copy paper from the storing means into the paper transportation system, means for determining the presence of copy paper in the storing means and providing a signal, means for determining the movement of the copy paper through the paper transportation system including a paper sensing monitor for providing a signal and a timing means initiated upon energization of a copying cycle to provide a first time period before introduction of copy paper into the paper transportation system, the improvement comprising:

a paper transport error detecting means responsive to the means for determining the movement of the copy paper and enabled by a signal representing a failure of copy paper to reach the paper sensing monitor within a predetermined time; and

control means connected to the paper transport error detecting means and the means for determining the presence of the copy paper in the storing means for disabling the paper transport error detecting means when the means for determining the presence of copy paper renders a no paper signal after energization of a copy cycle and before expiration of the first period of time.

4,394,089

COLOR PHOTOPRINTING WITH A SCANNING MEMORY MASK

Walter L. McIntosh, Woodbridge, and John N. Street, Alexandria, both of Va., assignors to LogEtronics, Inc., Springfield, Va.

Filed Sep. 23, 1981, Ser. No. 304,765
Int. Cl.³ G03B *27/04*
U.S. Cl. 355—88 **30 Claims**

1. A color contact printer for exposing an image receiving media from an image carrying media with a scanning spot of radiant energy, wherein said image receiving media is substantially opaque to at least one spectral component of said radiant energy, said printer comprising:

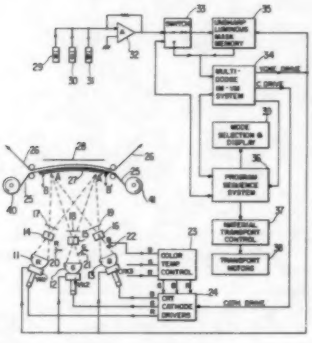
a. a single means for scanning said image carrying media with at least one scanning spot of radiant energy, said means subsequently being used to expose said image receiving media;

b. at least one photosensor means for measuring the radiant energy passing through the image carrying media, to generate density-related signals;

c. means responsive to said density-related signals for modulating said scanning spot to modify the effective contrast range and exposure level of said density-related signals;
d. luminous mask memory means for storing said modified density-related signals, said signals representing a density-corrected luminous mask of said image;
e. means for bringing said opaque image receiving media into intimate contact with said image carrying media after said luminous mask memory scan has been completed;
f. means for exposing said image receiving media through said image carrying media with said scanning spot of radiant energy, said exposing scan having said density-corrected luminous mask superimposed thereon to alter the exposing effect of said scanning spot to provide a density-corrected image on said image receiving media.

25. A method of automatically modifying the exposure level and contrast excursion limits for a color contact printer wherein an opaque photographic receiving media is used, said method comprising:

a. positioning a color original to be duplicated over a scanning spot light source, said light source having means to vary the respective blue, red and green components of said light;
b. prescanning said original with said scanning spot while



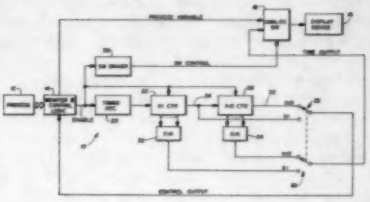
measuring the light passing through the original to determine its minimum and maximum density, the maximum density of the material, the difference between said minimum and maximum densities (ΔD) and its average density;
c. comparing the ΔD value to a predetermined reference value to generate a scanning spot control signal, said reference value representing the maximum contrast acceptance limits of said photographic receiving media;
d. memory scanning the original while simultaneously (1) modulating the scanning spot with said control signal, and (2) recording the light level passing through the original in a memory storage means, said controlled modulation being effective to alter the contrast excursion limits and determine the exposure level required, said modulated light level representing a modified luminous mask of the original to be duplicated;
e. positioning said opaque photographic receiving media over said color original and in intimate contact therewith;
f. exposing said opaque photographic receiving media with said scanning spot while modulating said spot with the luminous mask signal stored in said memory storage means, whereby the exposure level and contrast excursion limits of said exposure are retained within the predetermined contrast excursion limits of the opaque photographic receiving media.

4,394,090

PROCESS TIMING APPARATUS

Robert L. Hyde, Bartlesville, Okla., assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 6, 1981, Ser. No. 251,045
Int. Cl.³ G04F 8/00, 10/00
U.S. Cl. 368—121 **24 Claims**



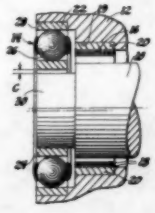
1. In a system for controlling a process, timing apparatus comprising a display device normally operative to display a value representative of a process variable; control means responsive to the process variable attaining a predetermined value for producing a control signal to change the process from a first state to a second state; timing means responsive to the process variable attaining said predetermined value for measuring, during a predetermined period of time, the elapsed time from the time at which the process variable attains said predetermined value and for producing a timing signal having an instantaneous value representative of the elapsed time; and means for displaying on the display device, during said predetermined period of time and in place of the value representative of the process variable, a value dependent upon the relationship between the value of the timing signal and the predetermined period of time.

4,394,091

AIR BEARING AND ANTIFRICTION BEARING ASSEMBLY

Edward D. Klomp, Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 9, 1981, Ser. No. 309,934
Int. Cl.³ F16C 21/00, 35/07
U.S. Cl. 384—101 **3 Claims**



1. A hydrodynamic foil bearing and anti-friction bearing assembly, comprising,

a shaft housing member having an axial bore,
a rotatable shaft member receivable within the axial bore with a predetermined maximum static eccentricity between the axis of the axial bore and the axis of the shaft member when the shaft member is at zero speed,
a hydrodynamic foil bearing within the axial bore for rotatably supporting the shaft member at a predetermined rotational speed with a predetermined minimum running eccentricity between the axis of the axial bore and the axis of the shaft member,
an antifriction bearing element within the axial bore axially

adjacent the hydrodynamic foil bearing and including inner and outer races and a complement of rolling elements disposed therebetween, one of the races being secured to one member of the shaft and housing members and the other race being engageable with the other member of the shaft and housing members at zero shaft speed and at low shaft speeds,

the other race being eccentrically spaced from the other member by an amount which is less than the maximum static eccentricity and greater than the minimum running eccentricity whereby the bearing element provides the sole support of the shaft member at zero speed,

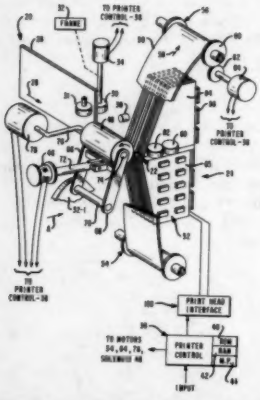
the support of the shaft member being shared between the bearing element and the foil bearing as the shaft member accelerates from zero shaft speed to running shaft speed, with the shaft member being solely supported by the foil bearing at running speed as the other race of the bearing element moves away from the other member and the shaft member rotates within the axial bore at the predetermined minimum running eccentricity.

4,394,092

METHOD AND APPARATUS FOR HIGH SPEED THERMAL PRINTING

Miroslav S. Osmera, and Ralf M. Brooks, both of Waterloo, Canada, assignors to NCR Canada Ltd. - NCR Canada Ltee, Mississauga, Canada

Filed Dec. 21, 1981, Ser. No. 333,148
Int. Cl.³ B41J *31/02*; G01D *15/10*
U.S. Cl. 400—120 **22 Claims**



1. An electroresistive printing apparatus comprising:

a printing station;

at least one printing unit at said printing station, with each said printing unit having a face, and with each said face being comprised of a matrix of resistive heating elements arranged in rows and columns so as to produce a printed dot density of a predetermined number of dots per millimeter;

means for positioning a record medium at said printing station;

means for providing a ribbon containing heat-transferrable ink at said printing station;

means for moving relatively said face of said printing unit, said ribbon, and said record medium into and out of printing relationship at said printing station;

means for energizing momentarily selected ones of said heating elements in said rows when said ribbon, said record medium and said face are in said printing relationship for transferring said ink to said record medium in accordance with a pattern of data to be printed so as to partially complete the printing of said pattern; and

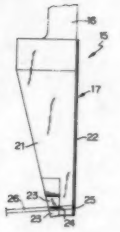
said moving means including indexing means for providing relative movement (along a line which is substantially perpendicular to said rows) among said face, said ribbon, and said record medium when they are in said printing relationship so as to present said rows of heating elements to an unprinted portion of said record medium to enable progressively the completing of said pattern of data, whereby upon predetermined numbers of energizations of said heating elements and subsequent indexings by said indexing means, said pattern of data is completed.

4,394,093

SUPPORT MEANS FOR PRINT WIRE

Kiyomitsu Asano, Musashino; Masao Jozuka, and Toshikatsu Kondo, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya and Nippon Telecommunication Engineering Company, Tokyo, both of, Japan

Filed Aug. 5, 1981, Ser. No. 290,298
Claims priority, application Japan, Aug. 12, 1980, 55-111426
Int. Cl.³ B41J *3/12*
U.S. Cl. 400—124 **3 Claims**



1. A print wire support device for a printer wherein a plurality of print wires are selectively driven in a longitudinal direction thereof to perform a printing action, said support device comprising:

an armature including an arm portion carrying each of said print wires, said arm portion being formed of a single planar blank by bending into a structure of a U-shaped cross section having opposite arms and a base, said arm portion having a free end and including

a pair of side portions corresponding to the opposite arms of said U-shaped cross section and facing toward each other, free end parts of said side portions being joined at inner surfaces thereof by welding in a plane parallel to said side portions to form a joined portion at said free end part of said arm portion, and

a connecting portion corresponding to the base of said U-shaped cross section and connecting said pair of side portions,

said joined portion being formed in spaced relation to said connecting portion and having a first supporting aperture formed therethrough substantially perpendicular to said connecting portion, each of said inner surfaces of said parts of the side portions being formed with a groove of semicircular cross section to define a substantially full 360° cylindrical inner surface defining said first supporting aperture when said inner surfaces are welded,

said connecting portion having a second supporting aperture formed through the thickness thereof and in alignment with said first supporting aperture along a line substantially perpendicular to said connecting portion,

said first and said second supporting apertures being spaced from each other by a predetermined distance along said line of alignment,

said print wires each having a fixed end portion welded to a portion of said connecting portion defining said second

supporting aperture, and said fixed end portion extending through said first supporting aperture in contact with said substantially full 360° cylindrical inner surface defining said first supporting aperture such that a bending force applied to said print wire upon said printing action is received by said cylindrical inner surface.

4,394,094

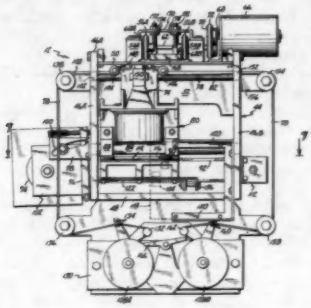
SLIDE MOTION SENSOR FOR SLIDE MOUNT DATA PRINTER

Robert A. Simning, Minneapolis, and Michael E. Schultz, Brooklyn Center, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Jan. 21, 1982, Ser. No. 341,297

Int. Cl.³ B41F *17/00*

U.S. Cl. 400—124 **10 Claims**



1. Apparatus for printing alphanumeric information on photographic slide mounts, the apparatus comprising:

a slide track along which the photographic slide mounts are advanced, the slide track including a printing station;

printer means for printing alphanumeric characters on a slide mount when the slide mount is positioned in the slide track at the printing station;

mount indexing means for causing the slide mount to be indexed from station-to-station along the slide track;

means for providing an eject signal indicating that a final slide mount of a customer order is at the printing station;

a pair of generally parallel conveyor belts adjacent opposite sides of the slide track and extending from the printing station toward the exit end so that a slide mount at the print station is held between the belts and the slide track and the motion of the slide mount as it enters the print station causes motion of the belts;

DC electric motor means responsive to the eject signal and connected to the conveyor belts for driving the conveyor belts to cause slide mounts located between the printing station and the exit end to be driven toward the exit end, the DC electric motor means generating an electric signal in response to motion of the belts as the slide mount enters the print station; and

control means responsive to the electric signal generated by the DC electric motor means for controlling the printer means and the mount indexing means.

4,394,095

SCAFFOLDING STRUCTURE

Eberhard Layher, Blankenhornstrasse 17, D-7129 Güglingen-Eisensbach, Fed. Rep. of Germany

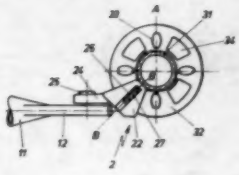
Filed Dec. 7, 1981, Ser. No. 328,100

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1981, 8112653[U]

Int. Cl.³ E04G *7/00*

U.S. Cl. 403—49 **3 Claims**

1. A scaffolding structure for use in scaffolding systems which include vertical supporting elements provided with annular flanges having radially directed apertures for receiving fastening wedges, said scaffolding structure comprising a scaffolding element formed at one end thereof with a terminal lug; a coupling shoe having two prongs arranged one above the other; an open slot formed between the prongs for engaging



the flange and an elongated slot formed in the prongs for receiving the fastening wedge, another flat lug projecting outwardly from the terminal end of said shoe at an angle of about 135° relative to the elongated slot, said flat lug having its sides extending parallel to said terminal lug and being pivotably connected thereto.

4,394,096

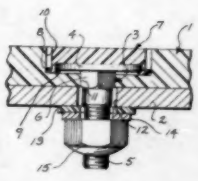
ATTACHMENT SYSTEM FOR PLASTIC LINERS

Bruce W. Stevens, Roanoke, Ind., assignor to Menasha Corporation, Neenah, Wis.

Filed Aug. 27, 1981, Ser. No. 297,023

Int. Cl.³ B25G *3/00*; F16B *2/14, 21/80*; F16G *3/00*

U.S. Cl. 403—408 **6 Claims**



1. In a system attaching a plastic liner to a substrate using a bolt with a plastic capped head that is received in an enlarged recess at the exposed liner surface to be flush with said surface and that has an attachment shank that extends through a shank opening in the liner at the bottom of the recess and into the substrate,

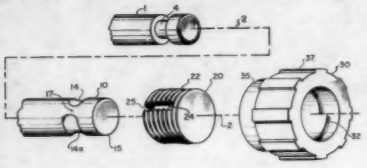
the improvement wherein:

the recess is straight-sided; the cap is straight-sided and includes a pheripheral portion that extends around the periphery of the bolt head and is peripherally smaller than the recess; and the peripheral portion includes a radially outwardly extending sealing skirt that is peripherally larger than the recess and is rolled upwardly when the bolt is inserted into a sealing engagement with the sides of the recess.

4,394,097
RETAINING APPARATUS

Wilhelm H. Horlacher, Hartford, Conn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Apr. 13, 1981, Ser. No. 253,435
Int. Cl.³ B25G 3/02; F16D 1/00
U.S. Cl. 403—360 4 Claims



1. A retaining assembly for use in mounting on a first member having a cylindrical aperture therein comprising:

a cylindrical member sized to extend through the aperture in the first member, said cylindrical member having a surface groove only part way around said cylindrical member near one end thereof to form abutments where the groove ends;

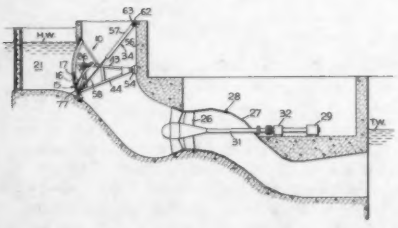
an externally threaded one-piece clip member having an inner cavity sized to snap over the end of said cylindrical member, an inner surface of the cavity having a convex partially circumferential ridge extending radially inwardly into the cavity and adapted to fit within the groove on said cylindrical member upon insertion of said cylindrical member into the cavity of said clip member to hold said clip member on the end of said cylindrical member, the ridge having an end portion which cooperates with the abutments to prevent the clip member from rotating with respect to said cylindrical members; and

a nut member internally threaded to cooperate with the external threading of said clip member and operable to be tightened against the first member to secure said cylindrical member with respect to the first member.

4,394,098
RADIAL GATE HAVING FINE TUNING OF FLOW CONTROL

Helmut H. Wirschal, York, and Warren G. Whippen, Dover, both of Pa., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 3, 1980, Ser. No. 203,537
Int. Cl.³ E02B 9/08; F03B 15/04
U.S. Cl. 405—77 2 Claims



1. An apparatus in operable combination with a hydraulic turbine for controlling a flow of water through a waterway in which said turbine, is located, comprising:

a radial gate within said waterway upstream of said turbine having a water face plate movable between a closed position for interrupting said flow of water through said waterway toward said turbine and a full open position permitting a generally uninhibited flow of water through said waterway toward said turbine;

means for moving said radial gate between said closed and full open position and operable to maintain said radial gate at preselected incremental open positions intermediate said closed and full open positions to permit a preselected incremental flow of water through said waterway toward said turbine;

a second gate carried by said radial gate and operable independent of the positioning of said radial gate to be selectively moved between a flow blocking position to a maximum open position with said second gate permitting a maximum supplemental flow of water through said waterway to said turbine when in said maximum open position and permitting generally no supplemental flow when in said blocking position; said water face plate of said radial gate having an opening therethrough operable to permit said maximum supplemental flow of water through said radial gate to said turbine and said second gate comprising a flap-gate having a water surface plate sized to completely cover said opening in said radial gate; said flap-gate being supported on said radial gate on a downstream surface thereof in said blocking position wherein said water surface plate covers said opening in said radial gate and movable from said blocking position to a maximum open position to permit said maximum supplemental flow of water through said opening toward said turbine; and

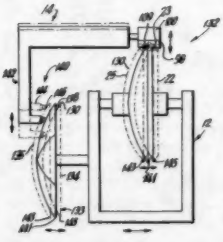
means for selectively moving said second gate between said blocking and maximum open positions independent of the positioning of said first gate comprising a power operator operably connected to said flap-gate to move said flap-gate between said flap blocking and maximum open position;

whereby said radial gate is positionable to an intermediate open position permitting only a predetermined amount of water to flow to the turbine which is less than an amount necessary to drive the turbine to achieve a synchronization of the turbine and said flap-gate may be operated to permit a supplemental flow of water to the turbine to fine tune the water flow to achieve synchronization and thereafter said radial gate may be opened to permit full water flow to the turbine.

4,394,099
PLASTIC LENS CONTOUR CUTTING MACHINE

Emil Santinelli, Carmel, N.Y., assignor to Lemay Corporation, Carmel, N.Y.

Filed Jan. 22, 1981, Ser. No. 227,225
Int. Cl.³ B23C 1/18; B24B 9/14
U.S. Cl. 409—104 12 Claims



1. An improved machine for cutting, edging, contouring, and beveling the periphery of a plastic lens, said machine being of the type having a head mounted on a base and carrying a lens pattern and a plastic lens which is to be cut and has a base curvature, means for rotating said pattern and said lens about a common axis, wherein the machine includes a carriage mounted on said base and having a pattern follower in bearing contact with said pattern and having a rotatable cutter with a cutting edge capable of engaging said periphery of said lens, said cutting edge forming a beveling means, means for moving

said carriage substantially perpendicular toward and away from said axis, said movement effecting an engagement of said cutter with said periphery of said lens, the improvement comprising:

said cutter having a cutter edge of a metal of a high hardness and rotatable at high speed, said cutter having a cutting face and a radial plane of rotation, said cutting face forming a clearance angle with said radial plane, said face operative to direct particles along said face away from said radial plane of rotation; and

bevel aligning means including base curve cam means connected to said head and cam tracing means connected to said carriage, said cam means having a surface forming the same base curvature as said lens, said tracing means being in bearing contact with said surface for effecting a movement of said head with said lens in a first direction to a position that aligns the center of said lens with said beveling means, said aligning means including biasing means connected to said head and said base and effecting a movement of said head in a second direction resulting in bearing contact of said surface of said cam means against said tracing means, said surface of said base curve cam means including a plurality of discrete sectors, each of said sectors having a different base curvature surface, said cam means rotatable to effect bearing alignment between the surface of any selected sector and said tracing means, whereby when said selected sector has a surface forming the same base curvature as the base curvature of said lens, said tracing means effects a movement of said head with said lens in said first direction to a position that aligns the center of said lens with said beveling means,

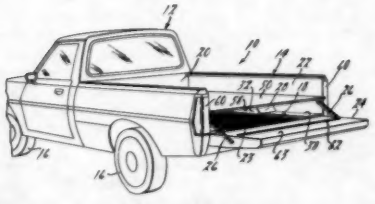
whereby when said lens and said lens pattern are rotated and said cutter is rotated at high speed, said carriage moves toward said axis effecting an engagement of said cutter with said lens periphery to cut and edge said plastic lens and simultaneously form a bevel at the center of said periphery.

4,394,100

PICKUP TRUCK CARGO BOX COVER ASSEMBLY

Harold K. Sperlich, Orchard Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 2, 1981, Ser. No. 307,709
Int. Cl.³ B62D *25/20*
U.S. Cl. 410—2 **6 Claims**



1. In combination with a pickup truck having an open cargo box formed of an upstanding front wall, upstanding sidewalls, a floor and a pivotally mounted rear tailgate defining a cargo area with a rearward access opening, said sidewalls including an opposed pair of wheel housings projecting upwardly from the floor and projecting inwardly into the cargo area, said tailgate hinged for pivotal movement about a horizontal axis between a substantially upright locked position closing at least a portion of the access opening and a lowered position; the improvement comprising:

first horizontally disposed channel means on said front wall extending a predetermined distance thereacross;

second horizontally disposed channel means on said tailgate in opposed relation with said first channel means whereby said channels define a horizontally extending plane spaced a predetermined distance above said cargo area floor;

each said wheel housing having an upper substantially planar surface located substantially in said horizontally extending plane;

rectangular panel means dimensioned such that its one forward marginal transverse edge is adapted to be snugly received in said first channel means, and

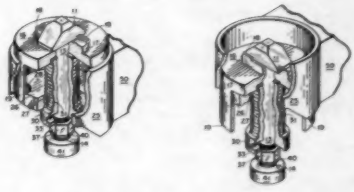
said panel means having a predetermined longitudinal dimension such that with said forward edge snugly received in said front wall channel means its other rearward transverse edge is adapted to be snugly received in said tailgate channel means with said tailgate in its upright closed position whereby said panel means is retained by said tailgate channel means providing a covered load space on the cargo area floor subjacent an upper level cargo area on said panel means.

4,394,101

HEIGHT ADJUSTABLE CARGO CONTAINER LOCKING MECHANISM

John E. Richer, Oceanside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 19, 1981, Ser. No. 225,883
Int. Cl.³ B60P *7/13*
U.S. Cl. 410—83 **15 Claims**



10. A locking mechanism for securing a cargo container having standard bottom located receptacle type fittings, comprising:

a housing which is adapted to be disposed beneath a fitting of the container, the housing having a bottom and an open top;

a platform slidably contained within the housing and adapted to be raised upwardly out of and lowered into the housing, the surface area of the platform being of a size to permit said platform to bear against the bottom of a respective fitting when in the upward position out of the housing;

elevator means for raising and lowering the platform;

a locking element mounted on top of the platform and adapted to be received within the container fitting;

means connected to the locking element and extending downwardly through the platform and downwardly through the housing for rotating the locking element within the fitting container.

4,394,102

SERVO AMPLIFICATION SYSTEM

Clarence F. Batchelder, Jamul; Charles E. Thomas, San Diego, and Kent B. Casady, La Jolla, all of Calif., assignors to Clipp Control Corporation, San Diego, Calif.

Filed Dec. 4, 1981, Ser. No. 327,386
Int. Cl.³ B25J *3/00*
U.S. Cl. 414—5 **13 Claims**

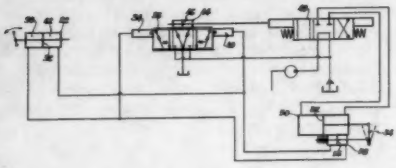
1. A servo amplification system comprising:

(a) a control cylinder having a double-acting control piston defining a first and second control chamber on opposite sides of said piston;

(b) a pilot value and a pilot cylinder having a double-acting piston and being operated by said pilot valve, said valve having a first and second inlet port connected to said first and second control chamber, respectively, to drive said pilot selectably in a first or second direction;

(c) a drive cylinder having a drive piston activated by a directional valve operated by said pilot cylinder;

(d) a feedback cylinder with a double-acting feedback piston



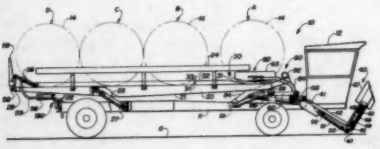
operatively connected to said drive piston to be moved thereby, said feedback cylinder defining first and second feedback chambers on opposite sides of said feedback piston, said first and second feedback chambers communicating with said second and first inlet ports respectively, such that movement of said control piston in a first direction operates, through said pilot valve and cylinder, said drive cylinder which moves a distance proportional to the distance moved by said control cylinder.

4,394,103

HYDRAULIC SYSTEM FOR A ROUND BALE WAGON

L. Dennis Butler, Kingsburg, and Alan R. Askov, Fresno, both of Calif., assignors to Sperry Corporation, New Holland, Pa.

Filed Jun. 23, 1981, Ser. No. 276,570
Int. Cl.³ A01D *87/12*
U.S. Cl. 414—24.5 **1 Claim**



1. In a bale wagon for picking up bales of crop material from the field, accumulating a plurality of bales and transporting the accumulated bales to a preselected storage location to be unloaded from the bale wagon, said bale wagon having a mobile frame adapted for movement across the field; a bale pickup means pivotally mounted on said mobile frame for individually engaging bales of crop material on the ground and elevating said bales onto the bale wagon; a load bed supported on said frame for accumulating a plurality of bales, said load bed including a receiving portion on which a number of bales may be deposited and arranged in a predetermined manner; means for arranging and positioning said bales deposited on said load bed by said bale pickup means; a hydraulic system including a first hydraulic cylinder for interconnecting said bale pickup means and said frame for pivotal movement of said bale pickup means to elevate bales onto said receiving portion of said load bed, a second hydraulic cylinder interconnecting said means for arranging and positioning said bales and said frame for operatively driving said means for arranging and positioning, control valves for controlling the flow of hydraulic fluid to each respective said hydraulic cylinder and conduit means in operative communication with said control valves and said hydraulic cylinders for transferring a flow of hydraulic fluid therebetween; and power means for operatively powering the flow of hydraulic fluid through said hydraulic system, an improved hydraulic system comprising:

said first hydraulic cylinder being connected hydraulically in series with said second hydraulic cylinder, such that hydraulic fluid flows between said first and second hydraulic cylinders without passing through one of said control valves; and

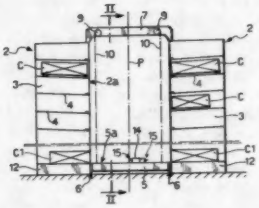
a relief valve connected to said conduit means to redirect the flow of hydraulic fluid away from said second hydraulic cylinder to said first hydraulic cylinder after said second hydraulic cylinder has reached the end of its stroke.

4,394,104

CONTAINER STORAGE INSTALLATION

Mario Camerini, Via Puntoni 5, and Giacomo Pizzi, Piazza Cavour 22, both of Livorno, Italy

Filed Jul. 16, 1980, Ser. No. 169,245
Claims priority, application Italy, Jul. 16, 1979, 17408 A/79
Int. Cl.³ B65G *1/06*
U.S. Cl. 414—276 **7 Claims**



1. In a container storage installation comprising: a warehouse having a plurality of elongated, container-receiving cells arranged in an array of rows and columns, a servicing passageway common to said cells and into which each cell opens by one end, and a container loading- and unloading unit displaceable horizontally and vertically in the said passageway for loading and unloading a container lengthwise into and from a selected cell, each cell having floor members supporting a container in the cell, and wherein the container comprises a standard corner block at each of its four lower corners, the improvement wherein:

the said floor members in each cell comprise a pair of transversely spaced guide rails extending longitudinally of the cell throughout substantially the whole length of the latter, and a trolly bridging the rails and having a container-supporting upper surface providing a support for a restricted lower front-edge region only of the container substantially corresponding to the lower corner blocks at that end, said trolly being freely rollable on the rails under a thrust applied thereto by a container during loading and unloading into and from the cell;

the rails in each cell are sloping towards the passageway whereby, as the leading end of a container being pushed into a cell takes its support on the trolly, the latter is entrained by the container to climb along the rails thereby to gradually lift the said leading end of the container;

the said loading- and unloading unit comprises a horizontally elongated elevator platform capable of supporting a container on its upper face, and a carriage displaceable on said face from one end to the other end of the platform, said carriage having thereon first means for gripping a container on the platform by an end pair of the corner blocks at the lower rear-edge region of the container to push and pull the container lengthwise thereof for respectively loading and unloading a cell and second means engageable with said end pair of blocks at the lower rear-edge region of said container to raise and lower said rear-edge region relative to said carriage to assist in the transfer of said container; and

wherein the end section of the platform adjacent the warehouse comprises transfer means for delivering to the trolly the said lower front-edge region of a container supported by the platform as the container is pushed by the carriage, said transfer means comprising a power-actuated pad in the upper face of the platform arranged to reciprocate longitudinally of the platform while lifting the said end region of the container by engagement with a corner block in said region.

4,394,105

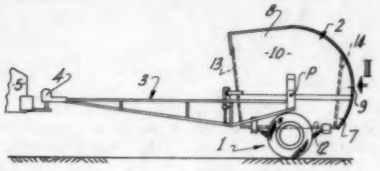
TIPPING TRAILER

Gordon B. Mitchell, R.D. 3, Hamilton, New Zealand

Filed Apr. 13, 1981, Ser. No. 254,011

Int. Cl.³ B60P 1/28

U.S. Cl. 414—436 **5 Claims**



1. A tipping trailer comprising a hopper having a base, side, front and rear walls, a pair of trailer wheels mounted to said base arranged to support the hopper from a ground surface during towing, a frame comprising a pair of substantially parallel side arms each being pivotably connected to the sides of the hopper at a point above the trailer wheels and a forward portion connecting the side arms and having a trailer coupling fixed at or near the leading end thereof by which the trailer can be connected to a towing vehicle, and locking means arranged to secure the hopper with respect to the frame during towing, wherein the side walls of the hopper are a matching pair, each having a first curved edge portion extending from the base forming a pair of skids for the hopper, the arrangement being such that upon release of the locking means the hopper and the trailer wheels may tilt about the pivotal connections between the side arms and the sides of the hopper such that an edge of the skids adjacent the base makes contact with the surface below and on reversal of the trailer the hopper and wheels revolve, the hopper rolls back on the curved skids, and the wheels pass upwards between the side arms whereby the hopper is upended.

4,394,106

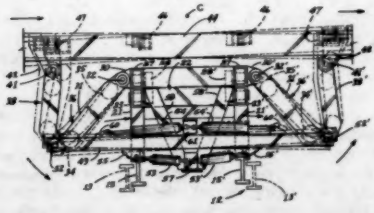
GLASS HANDLING LIFT TRUCK

Kenneth A. Frees, St. Peters, and Thomas E. Quick, Florissant, both of Mo., assignors to Missouri Research Laboratories, Inc., St. Charles, Mo.

Filed Aug. 24, 1981, Ser. No. 295,829

Int. Cl.³ B66F 9/14

U.S. Cl. 414—622 **8 Claims**



1. For use with a lift truck, a lift truck mechanism for handling glass sheets in packs comprising a glass pack lifting frame, gripping means at the sides of said lifting frame for engaging sides of a glass pack and support feet at the bottom of said lifting frame for supporting said glass pack, a framework of said mechanism for attachment to the lift mast of said truck, and further characterized by swinging frame means pivotally interengaging said framework and lifting frame to permit slewing and side-shifting movements of said lifting frame relative to said truck, first controllable motor means for effecting said side-shifting movement and second controllable motor means for effecting said slewing movement, said first motor means comprising first extendable-retractable hydraulic cylinder means effectively interengaging said framework and said swinging frame means, said second motor means comprising second extendable-retractable hydraulic cylinder means effectively interengaging said lifting frame and said swinging frame means, said swinging frame means including a first pair of oppositely disposed swingable frame members swingably engaged to said framework on opposite sides thereof and a second pair of oppositely disposed swingable frame members swingably interengaging distal ends of said first pair with said lifting frame, whereby said lifting frame may be controllably positioned both angularly and laterally relative to said truck for picking up and depositing glass sheets.

4,394,107

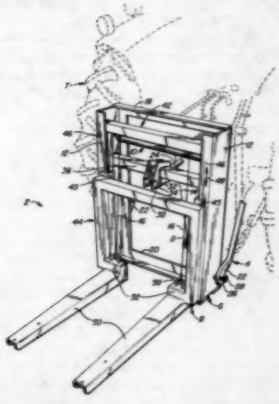
TRACTOR MOUNTED FORKLIFT

Steve L. Siebert, Clovis, Calif., assignor to D & S Manufacturing, Clovis, Calif.

Filed Nov. 5, 1981, Ser. No. 318,662

Int. Cl.³ B66F 9/06

U.S. Cl. 414—631 **7 Claims**



1. A forklift assembly for use in conjunction with a vehicle of the type having hitch means moveable in a generally vertical direction, the forklift assembly comprising:

a frame;

means for mounting said frame to the hitch means;

tine assembly means including a generally horizontal extension member moveably mounted parallel to a generally vertical first path along said frame;

roller means rotatably mounted to said frame;

a first cable having one end attached to and wrapped around said roller means in a first direction and having its other end attached to a point on said vehicle, said first direction chosen so that raising said frame along a generally vertical second path by the hitch means causes said first cable to unwind from said roller means; and

means operably coupling said roller means and said tine assembly means for raising said tine assembly along said

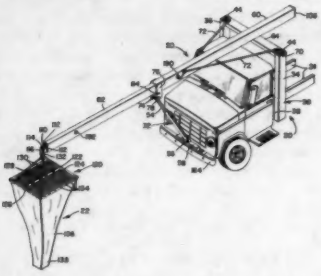
first path when said roller is rotated in a second direction, said second direction being opposite said first direction.

4,394,108

FRONT LOADER VEHICLE WITH TELESCOPING BOOM

Richard J. Cook, Hayti, and Richard Reade, Caruthersville, both of Mo., assignors to Mid-Continent Aircraft Corporation, Hayti, Mo.

Filed Dec. 21, 1977, Ser. No. 862,972
Int. Cl.³ B66C 23/04
U.S. Cl. 414—680 **9 Claims**



9. For use in a front loader vehicle which has integral frame structure with front and rear frame portions, a boom arrangement comprising: a front and a rear boom support means adapted respectively for rigid attachment to the front and rear frame portions of the vehicle; a telescoping boom structure; means pivotally mounting the rear end of said boom structure to the rear boom support means to permit elevation of said boom about a rear pivot axis from a horizontal position with the boom structure projected forward to an elevated position extending upward and forward; said front boom support means comprising an extensible power operated motor connected to the boom and adapted to be connected to the front truck frame portions; said boom structure having at least two telescoping elongate members, and comprising: outer and inner tubes, roller means carried by both tubes enabling a free rolling coaction between said tubes, the innermost elongate member being slidable from a fully retracted position to an extended position within the outermost elongate member; means to interlock said elongate members at least in fully retracted and fully extended interrelationship; said innermost tube, when the locking means are disengaged, being unrestrained and free to roll under inertia forces betwen the retracted and extended limit positions; and abutment means on each of said tubes adapted to provide an abutment telescopic limit engagement at the retracted position and at the extended position of the innermost tube; said means pivotally mounting the rear end of said boom structure including an elongated pivot cross beam disposed normal to said beam adjacent and under the rearward portion of the outermost tube with means rigidly securing said support beam to said outermost tube; and means mounted on the front end of the innermost elongate member for carrying a material dispensing container.

4,394,109

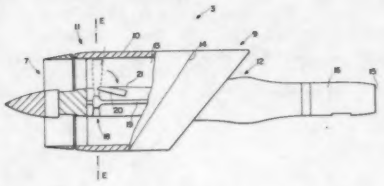
ARRANGEMENT AND EQUIPMENT FOR THE DISPLACEMENT OF BLADES, PARTICULARLY PROPELLER BLADES

Donald Ritchie, Immenstaad, Fed. Rep. of Germany, assignor to Dornier GmbH, Fed. Rep. of Germany

Filed Feb. 8, 1980, Ser. No. 119,806
Int. Cl.³ B64C 11/28
U.S. Cl. 416—142 **4 Claims**

1. In equipment for the adjustment of rotor blades, particularly propeller blades of fans, turbines, and the like, and especially for propulsion plants on aircraft adapted to be selectively shut-off in a low-resistance position, said equipment including a rotor hub with blades pivotally mounted thereon, said blades (**20**) having a longitudinal axis (L_A) and a twist ($\Delta\vartheta$) about said axis (L_A) between the chord line (S_{PF}) at the blade root and the chord line (S_{PS}) at the blade tip,

the improvement comprising means whereby said blades (**20**) are each selectively pivotal about pivot support means on the hub into an operational or a collapsed position,



said blades (**20**) when collapsed forming, by means of the position of pivot axes (**33**) of said pivot support means, helical cut-outs of a common cylindrical or conical envelope with the longitudinal axes (L_A) extending at a slant imparted by the twist ($\Delta\vartheta$) with respect to the longitudinal direction of said envelope,

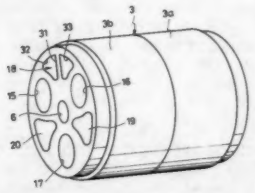
the position of the pivot axes (**33**) at a common base circle being determined by the slant of the pivot axes (**33**) with respect to the plane of rotation (E—E) of said blades (**20**) and by the slant of the axes (**33**) with respect to the chord line (S_{PF}) at the blade root.

4,394,110

SWASH-PLATE TYPE COMPRESSOR

Yutaka Ishizuka, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1980, Ser. No. 212,496
Claims priority, application Japan, Dec. 13, 1979, 54-172525
Int. Cl.³ F04B 1/18, 39/02
U.S. Cl. 417—269 **5 Claims**



1. A swash-plate type compressor comprising:

a cylindrical cylinder block having two cylindrical members combined together in axial alignment and horizontally disposed, each of said cylindrical members having an outer end face; a drive shaft extending through said cylinder block along an axis thereof and rotatable relative to said cylinder block; a swash plate secured on said drive shaft; and three pistons arranged within said cylinder block in engagement with said swash plate;

said cylinder block including:

three cylinder bores within which said pistons are slidably disposed, said cylinder bores being formed within said cylindrical members of said cylinder block in circumferentially spaced relation to each other and extending through said cylinder block axially thereof, two of said cylinder bores being located at upper portions of said cylinder block and one being located at a lower portion thereof;

three spaces formed within each one of said cylindrical mem-

bers of said cylinder block and opening in said outer end face of said each one cylindrical member, each of said spaces being arranged between adjacent ones of said three cylinder bores, one of said spaces being located at an upper portion of said each one cylindrical member and two of said spaces being located at lower portions thereof, said three cylinder bores being arranged in an array of an inverted triangle with the diametric centers of said cylinder bores located at the vertices of said inverted triangle, said three spaces being arranged in an array of a triangle with the diametric centers of said spaces located at the vertices of said triangle;

a chamber located at a central portion of said cylinder block, within which said said swash plate is arranged;

said two spaces located at said two lower portions of said each one cylindrical member being in communication with said swash plate chamber, said two lower spaces and said swash plate chamber forming an oil reservoir in which lubricating oil is stored;

a communication bore communicating said one space located at said upper portion of one of said cylindrical members with said one space located at said upper portion of the other of said cylindrical members; and

a vertical partition wall axially extending through said cylinder block, said vertical partition wall dividing said one space located at said upper portion of each of said cylindrical members into a high pressure medium chamber and a low pressure medium chamber, and also dividing said communication bore into two passages;

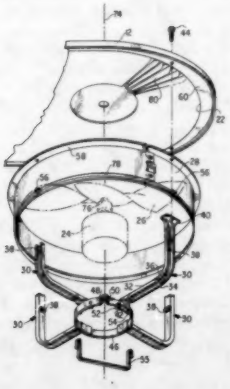
said high pressure chambers in said cylindrical members being communicated with each other by one of said passages of said communication bore, while said low pressure chambers in said cylindrical members being communicated with each other by the other of said passages of said communication bore, said high pressure medium chambers and said one passage of said communication bore serving as a passage for high pressure medium, and said low pressure medium chambers and said other passage of said communication bore serving as a passage for low pressure medium.

4,394,111

TOP COVER, MOTOR, FAN AND FAN SHROUD ASSEMBLY FOR AN AIR CONDITIONING UNIT

John M. Wiese, Red Bud, and Russell W. Hoeffken, Belleville, both of Ill., assignors to Snyder General Corporation, Red Bud, Ill.

Filed Sep. 11, 1981, Ser. No. 301,080
Int. Cl.³ F28F *13/12*; F04B *35/04*; F04D *29/54*
U.S. Cl. 417—360 **10 Claims**



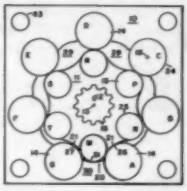
1. In an air conditioning unit, a top cover with a vent for the passage of air, a depending cylindrical shroud in communication with said vent, a fan and a motor for driving the fan having axes in common with the axis of the shroud, motor supporting legs which are connected to the shroud and have end flanged portions in substantially the same plane as the upper end of the shroud, and means for simultaneously fastening said flanged portions of the motor supporting legs to the top cover and drawing the upper end of the shroud snugly against the cover.

4,394,112

COMBINATION ROLLER TOOTH SET HAVING ROLLER TEETH AND CONCAVE SURFACES DISPOSED TO ENGAGE EACH OTHER

George V. Woodling, 22077 Lake Rd., Rocky River, Ohio 44116

Continuation of Ser. No. 103,905, Dec. 17, 1979, abandoned.
This application Aug. 13, 1981, Ser. No. 292,523
Int. Cl.³ F01C *1/113*; F16H *1/28, 55/10*
U.S. Cl. 418—61 B **3 Claims**



1. An inside and an outside combination roller tooth set comprising an inside rotary body member having a longitudinal rotary body axis, an outside stationary body member surrounding said inside rotary body member and having a longitudinal stationary body axis substantially parallel to said rotary body axis, said rotary body axis and said stationary body axis being displaced from each other, said inside rotary body member being internally unsupported and having freedom of movement to provide a rotational movement about its own rotary body axis and a recycling movement about said stationary body axis, said inside rotary body member having therein a plurality of inside roller teeth disposed substantially parallel to and extending circumferentially around said rotary body axis as a center, all of said inside roller teeth having substantially the same diameter and being spaced apart one from the other in a circumferential direction and defining inside adjacent roller teeth having substantially equal intervals therebetween, said outside body member having therein a plurality of outside roller teeth disposed substantially parallel to and extending circumferentially around said stationary body axis as a center, all of said outside roller teeth having substantially the same diameter and being spaced apart one from the other in a circumferential direction and defining outside adjacent roller teeth having substantially equal intervals therebetween, one of the said plurality of roller teeth being one less in number than the number of the other of said plurality of roller teeth, said inside body member being provided with a plurality of outwardly facing roller recesses into which said inside roller teeth may be respectively mounted, said outside body member being provided with a plurality of inwardly facing roller recesses into which said outside roller teeth may be respectively mounted, said inside and said outside roller teeth facing each other and defining a plurality of contactable cylindrical roller teeth, one of said body members having a plurality of longitudinally extending geometric concave surfaces respectively disposed between and in parallel relation to said adjacent roller teeth thereof, at least one of said geometric concave surfaces and at least a roller tooth in the other of said body members being disposed to engage each other and provide a concave-to-convex contact engagement therebetween, each of said roller teeth in one of said plurality of roller teeth having a diameter greater than the respective intervals between the adjacent roller teeth in the other of said plurality of roller teeth, said concave-to-convex contact engagement in combination with

said plurality of contactable cylindrical roller teeth externally and solely supporting said inside rotary body member for rotational movement about its own rotary body axis and for recycling movement about said stationary body axis.

4,394,113

LUBRICATION AND PACKING OF A ROTOR-TYPE COMPRESSOR

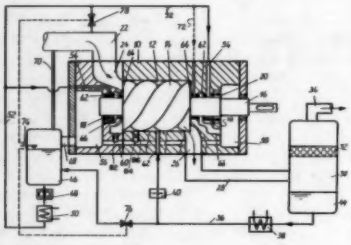
Karl Bammert, Hanover, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 5, 1980, Ser. No. 213,722

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1979, 2948992

Int. Cl.³ F01C *1/16*

U.S. Cl. 418—98 **10 Claims**



1. A rotary compressor comprising:

a housing defining a working space with an intake for receiving gas at low pressure to be compressed, a discharge for discharging compressed gas at high pressure and at least two oil spaces;

at least one rotor having a shaft rotatably mounted in said working space for compressing gas in said working space;

a radial plane bearing adjacent each oil space connected between each end of said shaft and said housing for rotatably mounting said rotor;

a shaft packing surrounding said shaft between each of said bearings and said working space;

a lubricating oil circuit including, an oil supply tank defining a tank space for receiving oil and gas, a supply conduit for supplying oil from said tank space to each bearing, and a return conduit for returning oil from said oil spaces to said tank space;

a pressure equalizing connection connected between said lubricating oil circuit and said low pressure intake to equalize the pressure of all of said oil lubricating circuit with pressure in said intake;

said housing defining a drain space surrounding said shaft and between said packing and said bearing at each end of said shaft for collecting oil flowing out from each bearing on one side of each drain space and gas flowing through each packing from said working space on opposite side of each drain space;

a drain channel connected respectively between each drain space and each oil space; and

an oil space conduit connected between said two oil spaces.

4,394,114

COMPRESSOR

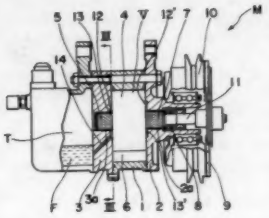
Teruo Maruyama, Neyagawa; Tadayuki Onoda, Toyonaka, and Tatsuhisa Taguchi, Shiga, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

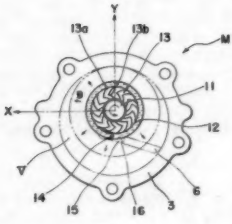
Filed Mar. 24, 1981, Ser. No. 247,084

Claims priority, application Japan, Mar. 27, 1980, 55-39729

Int. Cl.³ F03C *2/00*

U.S. Cl. 418—269 **10 Claims**





1. A compressor which comprises:

a cylinder having a hollow interior;

a rotor member rotatably eccentrically mounted in said hollow interior and having a plurality of outwardly open sliding recesses therein;

a plurality of vanes slidably mounted in corresponding sliding recesses and extending outwardly into sliding contact with the inner surface of said cylinder;

a rotor shaft on said rotor having the ends extending from the opposite ends of said rotor;

end plates secured to opposite ends of said cylinder and closing said hollow interior for defining a vane chamber in said cylinder, said ends of said rotor shaft being rotatably supported on said end plates, and the surfaces of said end plates and the surfaces of the ends of said rotor being in spaced opposed relationship to define a clearance therebetween, at least one of said opposed surfaces at at least one end said rotor having a ring-like groove therein spaced radially outwardly from said rotor shaft and into which the inner ends of said sliding recesses are open;

means for supplying a liquid lubricant under pressure into said ring-like groove; and

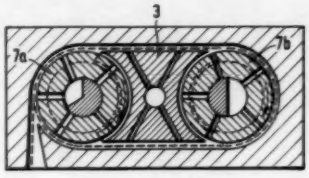
a dynamic pressure type fluid thrust bearing in said surface in which said ring-like groove is positioned and being between said ring-like groove and said rotor shaft, and including a plurality of grooves in said surface extending from said ring-like groove to said rotor shaft.

4,394,115

FORMING ARRANGEMENT FOR MACHINES MAKING RECEPTACLES OUT OF THERMOPLASTIC MATERIAL

Jean-Marc Dronet, Falaise, France, assignor to Societe d'Application Plastique Mecanique et Electronique Plastimecanique S.A., Falaise, France

Filed Apr. 3, 1981, Ser. No. 250,595
Claims priority, application France, Apr. 3, 1980, 80 07539
Int. Cl.[3] A23G 1/20; B29C 3/00
U.S. Cl. 425—122 5 Claims



1. An improved heat-forming molding machine for producing by deep drawing receptacles of thermoplastic material from plastic strips and sheets including means for feeding a plastic band into the mold cavity of the machine; the improvement comprising,

a fixed mandrel;

a mold having a mold cavity reciprocally movable relative to said fixed mandrel, said mandrel thereby moving into and out of said mold cavity,

said mandrel and/or mold defining a forming chamber adapted to receive a plastic banderole, which forming chamber and mandrel have contours which substantially correspond to that of the mold cavity so that said mandrel has a substantially fixed transverse cross-sectional area with respect to the forming chamber and mold cavity to thereby define a narrow guide passage for the plastic banderole;

said mandrel including a plurality of parts, a first number of these parts having transverse sections which remain fixed relative to said forming chamber and a second number of these parts have transverse sections which rotate relative to said forming chamber, the latter sections forming part of round or curved portions of the forming chamber, said rotatable transverse sections including suction channels for coacting and biasing the banderole against the rotatable parts of the mandrel to thereby impart an advancing motion to the banderole, said suction channels being in operative communication with a vacuum source.

4,394,116

MANDREL ADJUSTMENT SYSTEM IN A PLASTIC RESIN BLOW MOLDING MACHINE

Ernest O. Kuenzig, 32 Waverly St., Glen Head, N.Y. 11545, and Frank L. Pennino, 10 Leanore Dr., Farmingdale, N.Y. 11735

Filed Dec. 7, 1981, Ser. No. 327,902
Int. Cl.[3] B29D 23/04; B29F 3/06
U.S. Cl. 425—192 R 20 Claims

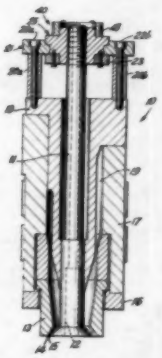
1. An apparatus in a plastic resin blow molding machine to adjust the vertical position of a vertically aligned mandrel relative to a forming die, the mandrel and forming die forming a tubular parison, in which the mandrel has a cylindrical top shaft portion having external screw threads, the forming die is positioned within a die block, the mandrel top shaft portion extends above the die block, and vertical spacer means are positioned on the die block,

the improvement comprising a horizontally aligned plate member connected to the spacer means and having an orifice therethrough, a mandrel adjustment nut having internal screw threads which mate with the screw threads of the top shaft portion of the mandrel, the adjustment nut being rotatably positioned on the plate member so that it freely rotates thereon, a ratchet ring means connected to the adjustment nut and having a plurality of spaced ratchet means about its external side wall so that its rotation will rotate the adjustment nut, and

a ratchet wrench means positioned on the ratchet ring means to rotate said ratchet ring means and its connected thereto adjustment nut to lower and raise the mandrel relative to the forming die, said ratchet wrench means having a ratchet pawl which fits, in sequence, into the spaced ratchet means and an arm member to apply rotational pressure to said ratchet ring means through said pawl and to thereby rotate said adjustment nut; and

set means to selectively lock said adjustment nut against rotation relative to the plate member.

10. An apparatus in a plastic resin blow molding machine to adjust the vertical position of a vertically aligned mandrel relative to a forming die, the mandrel and forming die forming a tubular parison, in which the mandrel has a cylindrical top shaft portion having external screw threads, the forming die is positioned within a die block, the mandrel top shaft portion extends above the die block, and vertical spacer means are positioned on the die block,



the improvement comprising a horizontally aligned plate member connected to the spacer means and having an orifice therethrough, a mandrel adjustment nut having internal screw threads which mate with the screw threads on the top shaft portion of the mandrel, the adjustment nut being rotatably positioned on the plate member so that it freely rotates thereon, a ring ratchet means about its external side wall so that its rotation will rotate the adjustment nut, and

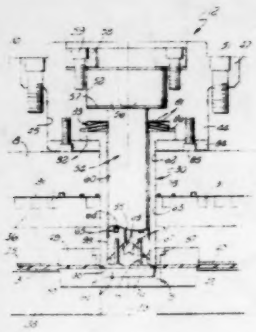
a ratchet wrench means removably positioned on the ratchet ring means to rotate said ratchet ring means and its connected thereto adjustment nut to lower and raise the mandrel relative to the forming die, said ratchet wrench means having a pawl which fits said spaced ratchet means and an arm member carrying said pawl and which at least partially spans and grips said ring ratchet means, and

clamp means removably attachable to said mandrel and fixed against rotation relative to said spacer means to selectively lock said mandrel against rotation relative to the spacer means while permitting vertical movement of said mandrel.

4,394,117
HOT SPRUE SLEEVE VALVE ASSEMBLY FOR AN INJECTION MOLDING MACHINE

Arnold E. Taylor, Lomita, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Jun. 10, 1981, Ser. No. 272,431
Int. Cl.³ B29F 1/03
U.S. Cl. 425—549 **31 Claims**



1. In an injection molding machine for producing centrally apertured record discs, a valve assembly for controlling flow of molten disc-forming material through a sprue bushing into a disc-shaped mold cavity, comprising:

a sleeve valve carried about the sprue bushing for axially sliding movement between a first position retracted from the mold cavity to allow flow of the molten disc-forming material through the sprue bushing into the mold cavity, and a second position advanced into the mold cavity to separate the sprue bushing from the mold cavity for preventing flow of the molten disc-forming material through the sprue bushing into the mold cavity and for molding a central aperture in the record disc; and

means for controlling movement of said sleeve valve between said first and second positions,

said control means moving said sleeve valve to said second position prior to solidification of said disc-forming material within the mold cavity,

said control means comprising a spring for biasing said sleeve valve toward said second position,

said sleeve valve including an angularly set pressure face at its end adjacent the mold cavity and oriented for communication with disc-forming material within the sprue bushing, said sleeve valve being responsive to the pressure of the material within the sprue bushing acting upon said pressure face for movement against said spring to said first position when the pressure reaches a predetermined magnitude.

4,394,118
METHOD AND ARRANGEMENT FOR REDUCING NO_x EMISSIONS FROM FURNACES

Johannes J. Martin, Leopoldstrasse 248, 8000 München 40, Fed. Rep. of Germany

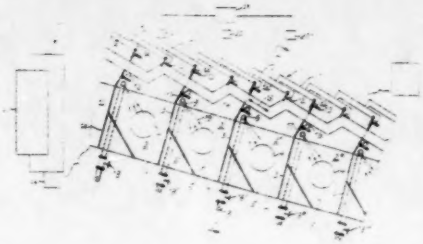
Filed Jul. 8, 1981, Ser. No. 281,309
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1980, 3025851
Int. Cl.² F23J 7/00
U.S. Cl. 431—4 **2 Claims**

1. A method of reducing NO_x emissions from combustion apparatus, particularly furnaces, comprising the steps of:

(a) establishing combustion in a combustion chamber of the type having a plurality of combustion zones and mixing zones wherein each of said mixing zones communicates with a respective combustion zone, said mixing zones being located below said combustion zones;

(e) introducing into each of said mixing zones a combination of steam, a portion of which having been generated in a closed steam system, and combustion air and mixing said combination, wherein said combustion air preheated by said steam is introduced in a generally clockwise direction to said steam in at least a portion of said mixing zones;

(c) admitting said mixed combination of steam and combustion air into each of said combustion zones;



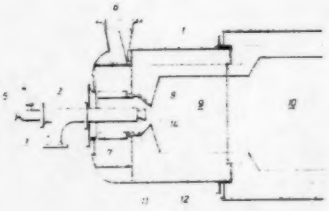
(d) monitoring the NO_x concentration of waste gases emitted from each of said combination zones; and

(e) adjusting the amount of steam introduced into each of said mixing zones in relation to the NO_x concentration of the waste gases emitted from its corresponding combustion zone.

4,394,119
PROCESS FOR COMBUSTING AMMONIA-CONTAINING GASES WHICH ALSO CONTAIN HYDROGEN SULFIDE

Jan Waller, and Philippus Loof, both of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 5, 1981, Ser. No. 231,839
Claims priority, application Netherlands, Feb. 26, 1980, 8001137
Int. Cl.³ F23D 13/20
U.S. Cl. 431—5 **8 Claims**



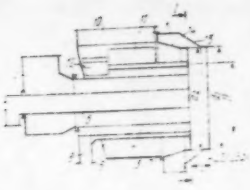
1. A process for combusting two gas streams, a first stream containing ammonia and hydrogen sulfide gases, and a second stream containing hydrogen sulfide gas and no ammonia, in the thermal zone of a sulfur recovery unit in which hydrogen sulfide-containing gases are partially combusted to a mixture of sulfur dioxide and hydrogen sulfide in a ratio of substantially 1:2 by supplying said hydrogen sulfide-containing gases to a burner consisting of a double gun having two concentric tubes and surrounded by an air register, which burner debouches into a mixing zone followed by a combustion zone, comprising supplying said second stream comprising primarily hydrogen sulfide-containing gases to the mixing zone via the outer of the two concentric tubes and mixing said stream in said mixing zone with an oxygen-rich gas or gas mixture supplied to the mixing zone via the air register, and separately supplying said first stream comprising primarily ammonia-containing gases to the thermal zone via the inner of the two concentric burner gun tubes, said ammonia-containing gases leaving the burner

and entering the mixing zone at about the plane of emergence of said hydrogen sulfide-containing gases, and combusting said gases in the combustion zone.

4,394,120
BURNER

Alexandr V. Golovanov; Vladislav Y. Eschenko; Irsali K. Musaev, and Zakhidzhan S. Talibdzhanov, all of Tashkent, U.S.S.R., assignors to Sredneaziatsky Filial Vniipromgaz, Tashkent, U.S.S.R.

Filed Jun. 10, 1981, Ser. No. 272,347
Int. Cl.³ F23Q 9/00
U.S. Cl. 431—284 **2 Claims**

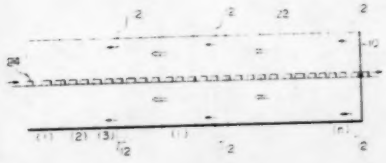


1. A burner comprising: concentrical shells defining annular passages including: a peripheral passage for a low-calorie gas; an intermediate passage for secondary air having auxiliary shells defining an annular passage for a high-calorie gas; a central passage for an air mixture; the circle of an average diameter of said annular passage for a high-calorie gas defining in the outlet section a central zone which amounts to between 0.38 and 0.5 of the total area of the outlet section of the burner; converging nozzles of minimum diameters equal to one another, said converging nozzles being installed in the outer shells of said peripheral passage and of said intermediate passage.

4,394,121
METHOD OF CONTROLLING CONTINUOUS REHEATING FURNACE

Yoshinori Wakamiya, Nishinomiya; Yoshiharu Hamasaki, Takarazuka; Masaki Kutsuzawa, Kobe, all of Japan, and Mitsubishi Denki Kabushiki Kaisha, 03, Tokyo, Japan

Filed Oct. 14, 1981, Ser. No. 311,331
Claims priority, application Japan, Nov. 8, 1980, 55-158387; Nov. 12, 1980, 55-159974
Int. Cl.³ F27D 3/00; F27B 9/40; C21B 7/24
U.S. Cl. 432—11 **1 Claim**

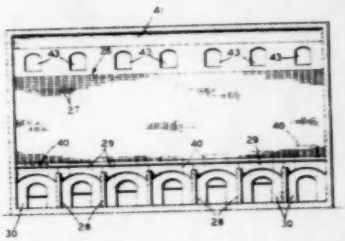


1. A method of controlling a continuous reheating furnace, comprising the steps of sensing the flow rates, at a plurality of time points, of fuel and air introduced into each of a plurality of control zones into which a continuous heating furnace is divided; determining the temperature profile within the furnace up to the present time point by using means for determining a change in the temperature profile within the furnace with respect to time from the sensed flow rates of the thus-introduced fuel and air; finding the temperature of each slab introduced into the furnace at the present time point by using said temperature profile within the furnace determined at the present time point; predicting a future change in the temperature of the furnace on the basis of the thus-determined present temperatures of the slabs and the flow rate of said fuel introduced into each of said control zones, said flow rate set, according to said temperature change determining means; determining the predicted slab temperatures by using said predicted change of said furnace temperature; determining the flow rate of said fuel introduced into each of said control zones so as to render the differences between said predicted slab temperatures and the corresponding objective slab temperatures so as to be not greater than a predetermined value, and controlling the flow rate of said introduced fuel following an objective value based on the flow rate of said fuel so determined.

4,394,122
FURNACE REGENERATOR WITH IMPROVED FLOW DISTRIBUTION

Alejandro G. Bueno, Toledo, and K. Lawrence Stover, Genoa, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Sep. 15, 1981, Ser. No. 302,641
Int. Cl.³ F24H 7/00; F27D 17/00
U.S. Cl. 432—30 **10 Claims**



1. In a method of equalizing the flow of exhaust gas and combustion air throughout the length of elongated regenerators extending along either side of the melting area of a continuous tank-type glass melting furnace, wherein the regenerators include an elongated checkerwork structure defining a multitude of gas passageways extending the complete length of the associated regenerator and having an open plenum space thereabove communicating with a plurality of ports spaced along the melting area, the improvement comprising alternately supplying combustion air to and withdrawing exhaust gas from said regenerators through a plurality of upwardly open chambers spaced therealong and below said checkerwork structure, and apportioning the flow of combustion air supplied and exhaust gases withdrawn among said chambers so as to produce more uniform flow of combustion air and exhaust gases through said checkerwork structure throughout the length thereof.

4,394,123
TILTABLE SUPPORT BRACKET FOR SLIDABLY SUPPORTING QUARTZ SUPPORT TUBES FOR SEMICONDUCTOR WAFER PROCESSING BOARDS, AND PROCESSING APPARATUS EMBODYING SUCH BRACKETS

Robert S. Higuera, Escondido, and John F. Ryan, San Diego, both of Calif., assignors to Northern Telecom, Inc., Nashville, Tenn.

Filed Feb. 9, 1982, Ser. No. 347,175
Int. Cl.³ F27D 5/00, 3/00
U.S. Cl. 432—253 **11 Claims**

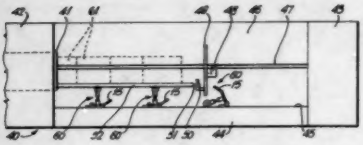
1. A tiltable support bracket comprising;
two spaced apart pillars;

a rotatable shaft extending between upper ends of said pillars;

a first member attached to and connecting lower ends of said pillars;

a second member hingedly connected to said first member for tilting of said first member about a hinging axis parallel to the rotational axis of said rotatable shaft;

said second member including means for attaching the second member to a support surface;



a projection extending from said first member on a side of said hinging axis remote from said second member;

the arrangement such that contact with said pillars by a third member moving in a first direction will tilt said pillars about said hinging axis to a substantially horizontal position with said projection extending up behind said third member, said third member engaging with said projection on reverse movement of said third member to tilt said pillars about said hinging axis to an upright position.

4,394,124

FLOTATION LIFE SUPPORT DEVICE

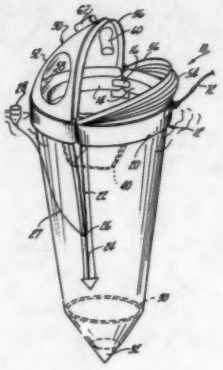
Harold W. Cooper, 30 Ensley, Oxford, Mich. 48051

Filed May 18, 1981, Ser. No. 265,040

Int. Cl.[3] **B63C** *9/00*

U.S. Cl. 441—86 **8 Claims**

1. A flotation life support device comprising: a buoyant ring member hinged at one circumferential point and forming an opening at a diametrically opposed point, a bag adapted to depend from said ring member when the latter is in a floating position, said bag having an open end attached to the periphery of said ring member, an opening formed in one side of said bag and being provided with a slide closure, said opening being in alignment with said opening in said ring member, a flexible seat member supported from said ring member within said bag for supporting an occupant, a canopy made of flexible material attached to the periphery at the upper side of said ring member, a slide fastener dividing said canopy into two portions extending from said hinge to said opening and being closable to enclose said ring member and the open end of said bag, said slide fastener closing the opening in said bag being in its most open position when the fastener is at a lower end of said opening, and a lanyard having one end attached to said slide fastener and having the other end provided with a flotation element.



4,394,125

PROCESS FOR BLEACHING TEXTILES AND FOR COMBATING MICRO-ORGANISMS WITH SULFONATED PHTHALOCYANINE OF ALUMINUM OR ZINC AND CONTAINING HALOGEN OR CYANO SUBSTITUENTS AS PHOTOACTIVATOR

Gerd Hölzle, Liestal; Gerhard Reinert, Allschwil, and Rudolf Polony, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 31, 1981, Ser. No. 298,229

Claims priority, application Switzerland, Sep. 9, 1980, 6764/80; Sep. 9, 1980, 6765/80

Int. Cl.³ D06L *3/00*; A01N *43/00*; C02F *1/50*

U.S. Cl. 8—103 13 Claims

1. In a process for combating micro-organisms in or on an organic or inorganic substrates by treating the substrate with one or more water-soluble phthalocyanines selected from the group consisting of the sulfonated zinc phthalocyanines and the sulfonated aluminium phthalocyanines, in the presence of water and under irradiation with light, the improvement which comprises using a phthalocyanine which is further substituted by a halogen atom or a pseudohalogen group.

4,394,126

DIESTER COMPOSITION AND TEXTILE PROCESSING COMPOSITIONS THEREFROM

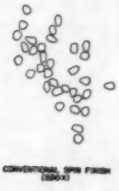
Robert B. Wilson, P.O. Box 6786, Greenville, S.C. 29606

Continuation-in-part of Ser. No. 90,092, Nov. 1, 1979, abandoned, and Ser. No. 203,636, Nov. 3, 1980, Pat. No. 4,293,305. This application Sep. 24, 1981, Ser. No. 305,028

The portion of the term of this patent subsequent to Oct. 6, 1998, has been disclaimed.

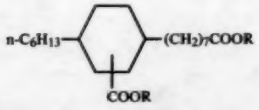
Int. Cl.³ D06M *1/00*

U.S. Cl. 8—115.6 36 Claims



1. In a textile treating composition containing one or more emulsifiers, dispersing agents and/or antistatic agents comprising one or more of ethoxylated castor oil, ethoxylated hydrogenated castor oil, ethoxylated alkylphenol, ethoxylated primary or secondary alkanol or a salt of a phosphated ethoxylated primary alkanol or alkylphenol, the improvement wherein the composition contains:

(a) a cycloaliphatic diester of the formula



wherein R is substituted or unsubstituted straight or branched chain alkyl of 4–20 carbon atoms, polyoxyalkylene of the formula $HO(CH_2CH_2O)_nCH_2CH_2$—, $HO(C_3H_6O)_nC_3H_6$—, $HO(CH_2CH_2O)_p(C_3H_6O)_qC_3H_6$—, or $HO(C_3H_6O)_p(C_2H_4O)_qC_2H_4$— or phosphated polyoxyalkylene, wherein n is 2–22 and the sum of p+q is n;

(b) a high boiling aromatic ester of the formula ArCOO—R_1—OOCAr or ArCOOR_2, wherein Ar is a monocyclic aryl of up to 10 carbon atoms; R_1 is alkylene of 2–8 carbon atoms or polyoxyalkylene of the formula —C_rH_{2r}—$(O—C_rH_{2r})_s$— in which r is 2 or 3 and s is up to 15; and R_2 is alkyl or alkenyl of 8–30 carbon atoms;

wherein the ratio of cycloaliphatic diester to high boiling aromatic ester is 0.1:1 to 10:1 and wherein the combination of cycloaliphatic diester and high boiling aromatic ester constitutes 10–90% by weight of the textile-treating composition.

4,394,127

METHOD OF DEPOSITING PERFUME AND COMPOSITIONS THEREFOR

James B. Melville, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,484

Claims priority, application United Kingdom, Feb. 7, 1980, 8004106; Feb. 7, 1980, 8004107; Feb. 7, 1980, 8004108

The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.

Int. Cl.³ A61K *7/46*; B08B *3/00*; C11D *3/50*, *17/01*

U.S. Cl. 8—137 6 Claims

1. A method of cleaning and depositing perfume on a fabric surface, comprising contacting the fabric surface with an aqueous composition containing a perfume and from about 0.05 g per liter to about 8.5 g per liter, based on the volume of the aqueous composition, of a water-soluble detergent active material, with or without a detergency builder, characterized in that the perfume is added to the aqueous composition in the form of from about 0.005 g per liter to about 0.3 g per liter, based on the volume of the aqueous composition of particles having an average size of from about 0.1 micron to about 2000 microns, the particles being an intimate mixture of (a) from about 0.5% to about 50% by weight, based on the weight of the particles, of a perfume component; and (b) from about 50% to about 99.5% by weight, based on the weight of the particles of a matrix comprising at least one water-dispersible amine of the formula

$$R—N—R_1R_2$$

where R is an alkyl or alkenyl group having 8 to 22 carbon atoms, R_1 is hydrogen or an alkyl or alkenyl group having 1 to 4 carbon atoms, and R_2 is hydrogen or an alkyl or alkenyl or amino-alkyl group having 1 to 22 carbon atoms, the matrix containing no added cationic material.

4,394,128

METHOD OF SIZING POLYESTER YARN

Hal C. Morris, Warminster, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 31, 1980, Ser. No. 202,543

Int. Cl.³ D01C *3/02*; D06L *1/06*, *1/14*; B65H *71/00*

U.S. Cl. 8—138 12 Claims

1. A method of sizing polyester yarn for weaving comprising the steps of (1) applying thereto a free radical initiated vinyl polymer latex having an acid pH and a weight average molecular weight from about 300,000 to 2,500,000; said polymer in dried film form being hydrophobic and not redispersible in a solution at a pH from about 2 to 7 but redispersible by an aqueous alkaline medium, said polymer being prepared from monomers consisting essentially of, by weight, 45 to 65% butyl acrylate, 28 to 45% styrene and/or methyl methacrylate, and 8 to 14% acrylic acid and/or methacrylic and (2) drying the yarn.

9. The method of claim 1 in which said monomers consist essentially of about 50 to 60% butyl acrylate, 28 to 40% styrene and 10 to 13% methacrylic acid.

11. A method of weaving comprising the steps of preparing a polyester yarn in accordance with the method of claim 1, 2, 3, 4, 5, 6, 7, 8, or 9, weaving the yarn into fabric, and removing said vinyl polymer therefrom by an aqueous alkaline solution.

4,394,129

PROCESS FOR THE FINISHING OF FIBROUS MATERIALS: SULFONYL- OR CARBONYL-CYANAMIDES OF DYESTUFFS

Hartmut Springer, Königstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 179,992, Aug. 21, 1980, abandoned. This application Aug. 26, 1981, Ser. No. 296,469

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934247

Int. Cl.³ C07C *125/08;* C09B *33/15;* D06P *1/16*

U.S. Cl. 8—543 1 Claim

1. In a process for coloring a fibrous material made of wool, synthetic polyamide fibres or cellulose fibres, or of mixtures thereof, which comprises applying an organic dyestuff in the form of an aqueous or organo-aqueous solution or dispersion onto said fibrous material and treating it at a temperature of from 60° to 230° C. for fixation of the dyestuff on the substrate, the improvement consisting of employing as the organic dyestuff an organic dyestuff containing one or several groups of the formula

in which X is sulfonyl or carbonyl and A is hydrogen or the equivalent of a mono-, bi- or trivalent metal or is ammonium.

4,394,130

COPPER PHTHALOCYANINES HAVING TRIMETHYLAMMONIUMMETHYL GROUPS AS PAPER DYES

Helmut Moser, Reinach, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

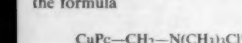
Continuation-in-part of Ser. No. 122,117, Mar. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 696,152, Jan. 8, 1968, abandoned. This application Jan. 8, 1976, Ser. No. 647,432

Claims priority, application Switzerland, Jan. 18, 1967, 706/67; Jan. 4, 1968, 87/68

Int. Cl.³ C09B *47/04*

U.S. Cl. 8—661 7 Claims

1. A process for producing turquoise paper comprising (a) incorporating into paper stock an effective amount of a dye of the formula



or a mixture thereof, wherein

CuPc is a copper phthalocyanine radical having not more than 0.5 mol of sulfo group per molecule, and

n is 2 or 3,

said effective amount being an amount sufficient to impart the desired turquoise color to the paper to be formed, and (b) forming turquoise paper from said paper stock.

4,394,131

COMBUSTION FUEL EMULSION

Joseph Marro, Jr., West Haven, and Gurdon B. Wattles, North Haven, both of Conn., assignors to Entoleter, Inc., New Haven, Conn.

Continuation of Ser. No. 842,090, Oct. 14, 1977, abandoned. This application Mar. 14, 1980, Ser. No. 130,387

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 9 Claims

1. A stable combustion fuel emulsion consisting essentially of a petroleum fuel as the continuous phase and water droplets dispersed therein, wherein said water is present in an amount less than about 20% by weight, and wherein said water droplets are substantially all of a size less than about 0.5 micron, said emulsion being free of surfactants.

4,394,132

PARTICULATE COAL-IN-LIQUID MIXTURE AND PROCESS FOR THE PRODUCTION THEREOF

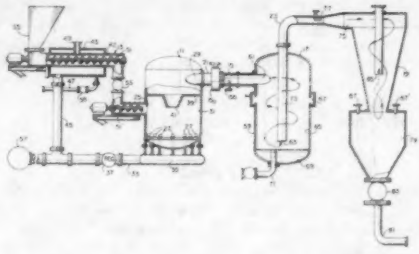
David W. Taylor, Edgemont, Pa., assignor to Ergon, Inc, Jackson, Miss.

Filed May 19, 1980, Ser. No. 151,358

The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 49 Claims



1. An improved process for producing a particulate coal-in-liquid mixture comprising:

a. grinding raw coal to a particle size of less than about 40 microns in a substantially air-free environment using a gaseous carrier medium to form a hydrophobic coal-fraction and a hydrophilic ash-fraction;

b. contacting said fractions with an aqueous liquid whereby the particles constituting the ash fraction are wetted, but the particles constituting the coal fraction are left substantially dry;

c. separating the ash particles from the coal particles; and

d. mixing the coal particles with liquid.

4,394,133

ALKYL ACETATES AS PHASE SEPARATION INHIBITORS IN LIQUID HYDROCARBON FUEL AND ETHANOL MIXTURES

Harry A. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 1, 1982, Ser. No. 353,135

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—56 15 Claims

1. A method for preventing a mixture of hydrous ethanol and a liquid hydrocarbon fuel from separating into two phases comprising adding to the mixture an effective amount less than about 1 percent by weight of the liquid hydrocarbon fuel and hydrous ethanol of a phase separation inhibitor wherein the inhibitor is selected from the group of alkyl acetates which have:

(a) a solubility parameter of about 8.4 to 9.8 $(cal/cc)^{\frac{1}{2}}$; and

(b) a dipole moment of about 1.75 to 1.90 debye.

4,394,134

REDUCING FUEL CONSUMPTION WITH A FLUORINATED COMPOUND

Carleton N. Rowe, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

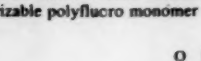
Continuation-in-part of Ser. No. 866,084, Dec. 30, 1977, abandoned. This application Nov. 9, 1979, Ser. No. 92,861

Int. Cl.³ C10L *1/20*

U.S. Cl. 44—62 10 Claims

1. A method for decreasing fuel consumption in an internal combustion engine by adding to the lubricating oil or liquid

hydrocarbon fuel used therein a sufficient amount of a polymerizable polyflucro monomer compound of the formula



wherein R is a C_3 to C_{17} aliphatic hydrocarbon group containing from 5 to 35 fluoride groups, R' is hydrogen or a C_1–C_3 hydrocarbyl group and R'' is hydrogen or a C_1–C_{18} hydrocarbyl group and polymerizing said monomer during engine operation to form an amount of a polymer thereof to effect a reduction in fuel consumption of said engine.

4,394,135

LIQUID HYDROCARBON FUEL COMPOSITION

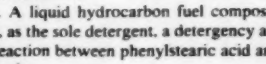
Harry J. Andress, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 945,280, Sep. 25, 1978, abandoned. This application Jun. 6, 1980, Ser. No. 156,969

Int. Cl.³ C10L 1/22

U.S. Cl. 44—71 **3 Claims**

1. A liquid hydrocarbon fuel composition comprising fuel and, as the sole detergent, a detergency amount of the product of reaction between phenylstearic acid and a polyamine of the formula



wherein n is from 2 to 4 and x is 1 to 9 and wherein the reactants and employed in proportions such that sufficient acid is present to completely acylate the said polyamine.

4,394,136

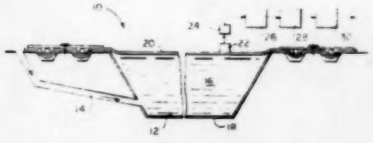
SYSTEM FOR RECOVERING METHANE GAS FROM LIQUID WASTE

Dietrich W. Grabis, San Rafael, Calif., assignor to United International California Corporation, San Rafael, Calif.

Filed Jan. 4, 1982, Ser. No. 336,884

Int. Cl.³ C02F 11/04

U.S. Cl. 48—111 **9 Claims**



1. A system for recovering methane gas from liquid waste, comprising: an open pit extending into the ground; a cover sheet disposed over said pit; means for disengagably holding a circumferential portion of said cover sheet adjacent to a section of the ground circumscribing said pit in an air sealed fashion, whereby said sheet can be repeatedly used to cover and uncover said pit without damage to the sheet, said holding means including a downwardly extending and upwardly opening trench which extends around said pit along said section of ground circumscribing the latter and which is filled with water for receiving said circumferential portion of said cover, said holding means also including means located within said trench for maintaining a circumferential segment of said sheet portion under the water in said trench; means for directing liquid waste into said pit so as to produce said methane gas within said pit; means for removing said gas from said pit; and means for removing the waste from said pit.

4,394,137

PARTIAL OXIDATION PROCESS

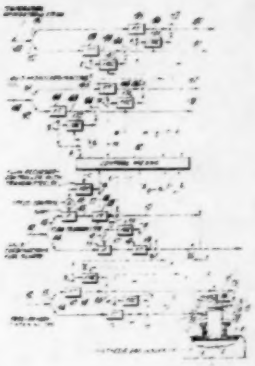
Charles P. Marion, Mamaroneck; William B. Crouch, Chappaqua; Albert Brent, Huntington, all of N.Y.; George N. Richter, San Marino, Calif.; Edward T. Child, Tarrytown, N.Y., and Blake Reynolds, Riverside, Conn., assignors to Texaco, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 212,054, Dec. 3, 1980, Pat. No. 4,371,378, which is a continuation-in-part of Ser. No. 167,876, Jul. 14, 1980, Pat. No. 4,351,645, which is a continuation-in-part of Ser. No. 107,215, Dec. 26, 1979, Pat. No. 4,338,099. This application Jun. 10, 1981, Ser. No. 272,420

The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.

Int. Cl.³ C10J 3/46

U.S. Cl. 48—197 R **20 Claims**



1. In a process for producing gaseous mixtures comprising H_2, CO, CO_2, entrained particulate carbon, and at least one material from the group consisting of H_2O, N_2, H_2S, COS, CH_4, Ar, and ash in a free-flow noncatalytic partial oxidation gas generator, the improvement employing a burner having a central section with separate first and second fluid passage means and an annular section with separate third and fourth fluid passage means, and changing from one reactant feedstream to another without shutting down or depressurizing the system comprising the steps of:

(1) passing a first reactant stream of first solid carbonaceous fuel slurry or hydrocarbonaceous fuel with or without mixture with H_2O through either the first or second fluid passage means in the central section of said burner, and/or simultaneously passing a second reactant stream of said first solid carbonaceous fuel slurry or hydrocarbonaceous fuel with or without mixture with H_2O through either the third or fourth fluid passage means in the annular section of said burner; wherein the central section of the burner includes a central conduit, said central conduit being closed at the upstream end and having an unobstructed downstream circular exit orifice at the tip of the burner; said annular section being bounded by an outer conduit coaxial and concentric with said central conduit along its length and in spaced relationship therewith and forming an annular passage therebetween, said annular passage being closed at the upstream end and having an unobstructed downstream annular exit orifice at the tip of the burner and wherein the central longitudinal axis of the annular passage is parallel to the central longitudinal axis of the burner throughout its length; said first passage means comprises a central bunch of tubes passing through the closed end of said central conduit and making a gas-tight seal therewith, and wherein the downstream ends of said central bunch of tubes are retracted upstream from the burner face a distance of about 0 to 12 times the mini-

mum diameter of the central conduit exit orifice at the tip of the burner; said second passage means comprising the space between the inside wall of said central conduit and the outside surfaces of the central bunch of tubes; said third passage means comprising an annular bunch of tubes passing through the closed end of said annular passage and making a gastight seal therewith, and wherein the downstream ends of said annular bunch of tubes are retracted upstream from the burner face a distance of about 0 to 12 times the minimum width of the annular exit orifice at the tip of the burner; and said fourth passage means comprising the space between the inside wall of the outer conduit and the outside surfaces of the annular bunch of tubes;

(2) simultaneously passing a separate reactant stream of free-oxygen containing gas with or without mixture with a temperature moderating gas through the unused fluid passage means in each of the central and/or annular sections of said burner which are related to said fluid passage means through which said stream(s) of first solid carbonaceous fuel slurry or hydrocarbonaceous fuel with or without mixture with H_2O are passing;

(3) mixing together said reactant streams from (1) and (2) to produce a well-distributed blend, and reacting said mixture by partial oxidation in the reaction zone of said gas generator at an autogenous temperature in the range of about 1700° to 3500° F., a pressure in the range of about 1 to 300 atmospheres, an atomic ratio of oxygen/carbon in the range of about 0.5 to 1.7, and a weight ratio H_2O/fuel in the range of about 0 to 5.0;

(4) replacing in said central and/or annular section(s) one or more of said reactant stream(s) of first solid carbonaceous fuel slurry or hydrocarbonaceous fuel with or without mixture with H_2O with a replacement stream of a second carbonaceous fuel slurry or hydrocarbonaceous fuel with or without mixture with H_2O; and simultaneously with (4) or after completion of (4);

(5) controlling the temperature and weight ratio H_2O/fuel in the reaction zone at design conditions by adjusting the flow rate(s) of the reactant stream(s) of free-oxygen containing gas with or without mixture with a temperature moderating gas passing through the burner, and if necessary introducing supplemental H_2O into the reaction zone.

4,394,138

DIVERGING VORTEX SEPARATOR

John R. Schilling, P.O. Box 4291, Woodside, Calif. 94062

Filed Jan. 19, 1979, Ser. No. 4,805

Int. Cl.³ B01D *45/12*

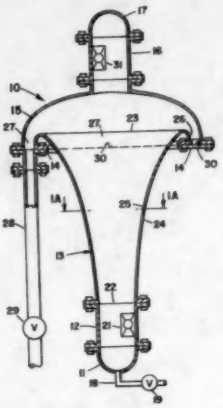
U.S. Cl. 55—1 **10 Claims**

1. A separator for separating the liquid and gaseous phases of a fluid mixture thereof comprising:

a vertical and upwardly diverging vortex section having a lower inlet, an upper outlet, and a vertically-continuous inner surface between said inlet and said outlet which is circular in configuration normal to the vertical axis of said vortex section throughout its height and which expands substantially hyperbolically,

means for introducing said fluid mixture into said inlet of said vortex section with a substantial component of tangential velocity,

first outlet means above said outlet of said vortex section for discharging the gaseous phase of said mixture from said separator,



second outlet means surrounding said outlet of said vortex section for discharging the separated liquid phase outwardly from said outlet of said vortex section.

4,394,139

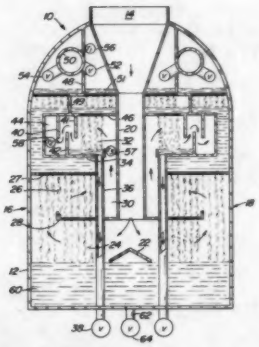
DIRECT CONTACT CONDENSER AND SEPARATING METHOD

Robert D. Board, Boca Raton, Fla., assignor to Ecolaire Incorporated, West Easton, Pa.

Filed Mar. 4, 1982, Ser. No. 354,825

Int. Cl.³ B01F *3/04*

U.S. Cl. 55—20 **6 Claims**



1. A direct contact condenser including a housing having a partition, a manifold water supply conduit having valves for discharge to opposite sides of the partition, means defining a plurality of showers below the elevation of said partition and through which a gas stream will pass sequentially, each shower receiving water from one side of said partition, means for introducing a gas stream sequentially through said showers, the last shower being provided with temperature sensors, means for controlling water flow from said supply conduit to said last shower in response to the differential of said sensors, and collection means for collecting water from said last shower while preventing the collected water from mixing with water from other showers, and an outlet chamber downstream

from said last shower where noncondensible gases collect for subsequent treatment.

4,394,140

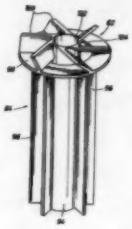
DEGASSING SYSTEM AND CENTRIFUGAL PUMP

Walter E. Liljestrand, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 865,989, Dec. 30, 1977, Pat. No. 4,331,458. This application Apr. 5, 1982, Ser. No. 365,402

Int. Cl.³ B01D *19/00, 45/00*

U.S. Cl. 55—184 **40 Claims**



1. In a system for degassing liquid containing mediums, said system including a degassing vessel having an inlet and an outlet and a generally vertical shaft centrifugal pump connected to said vessel for introducing said liquid medium into said vessel, the improvement wherein said pump comprises:

means defining an inlet housing, said inlet housing having at least one inlet for the intake of said liquid medium;

means defining a pump casing having at least one outlet for the discharge of said liquid medium, said pump casing and said inlet housing being in open communication with one another;

a pump impeller rotatably mounted in said pump casing for pumping said liquid medium into said degassing vessel;

a pump frame at least partially defining a vent chamber, said pump frame including an apertured partition, said aperture providing open communication between said vent chamber and said inlet housing;

said inlet housing being disposed between said vent chamber and said pump casing, said pump casing being disposed below said inlet housing;

an inlet impeller rotatably mounted in said inlet housing closely adjacent said apertured partition and operative to direct fluid from said vent chamber into said inlet housing;

and egress passage means communicating with said inlet housing adjacent said apertured partition for directing gas accumulating in the upper portion of said inlet housing vertically upwardly away from said inlet housing.

4,394,141

EXPANSION TANK AND WATER BOX DEVICE FOR HEAT EXCHANGER, SUCH AS A RADIATOR OF A MOTOR VEHICLE

Patrick Cadars, Maurepas, and Bruno Hellouin de Cenival, Noisy le Roi, both of France, assignors to VALEO, Paris, France

Continuation of Ser. No. 48,249, Jun. 13, 1979, Pat. No. 4,289,507. This application May 14, 1981, Ser. No. 263,357

Claims priority, application France, Jun. 15, 1978, 78 17966

The portion of the term of this patent subsequent to Sep. 15, 1998, has been disclaimed.

Int. Cl.³ B01D *53/00;* **F01P** *5/10*

U.S. Cl. 55—195 **45 Claims**

1. In a heat exchanger for an automotive vehicle, said heat exchanger including a plurality of substantially parallel heat exchanging tubes and a collector plate having a plurality of openings, each of said openings being traversed, respectively, by an end of one of said tubes for the purpose of mounting the same, the combination of:

(a) an expansion tank;

(b) said expansion tank having a peripheral edge portion sealingly connected to said collector plate;

(c) a water box disposed inside said expansion tank, said water box comprising a partition separate from said expansion tank;

(d) said partition having a hollow cross sectional profile and two opposed longitudinal edges engaging said collector

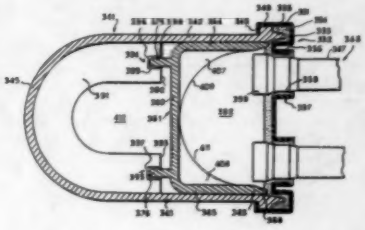


plate on each side of said tube ends, respectively, to define a collector chamber between said partition and said collector plate;

(e) said partition also forming a compensation chamber between said water box and said expansion tank;

(f) means for holding said partition in place between said expansion tank, and said collector plate when said expansion tank and collector plate are sealingly connected; and

(g) said means for holding including at least one rib interposed between said expansion tank and said partition.

4,394,142

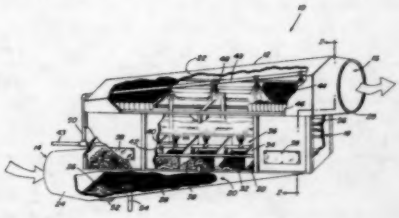
WATER SPRAY COOLER

Edward D. Thimons, Bethel Park, Pa.; Kenneth S. Heller, Newton; John F. McCoy, III, Chelmsford, both of Mass., and Austin Whillier, Johannesburg, South Africa, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation of Ser. No. 185,671, Sep. 10, 1980, abandoned. This application Nov. 2, 1981, Ser. No. 317,638

Int. Cl.³ B01D *47/00*

U.S. Cl. 55—242 **3 Claims**



1. An apparatus for cooling air supplied to underground mines by its direct contact with cooler water comprising:

a housing for the heat exchanger having structural elements therein which form an air inlet chamber to receive an air stream to be cooled and an upper outlet chamber to exhaust the cooled air stream;

said housing also having structural elements which form a water spray chamber between said inlet and outlet chambers, said spray chamber being in fluid communication with the inlet and outlet chambers;

an air inlet port in said housing in fluid communication with

said air inlet chamber to receive air from the underground mine and allow it to enter the housing;

an air outlet port in the upper portion of said housing in fluid communication with the outlet chamber to allow cooled air to exit from the housing into the underground mine; air deflection means mount in said inlet chamber for deflecting the incoming air to be cooled into the spray chamber, said deflector means comprising a lattice shaped framework;

water collecting means mounted at the lower end of the inlet chamber;

water spray means mounted in said spray chamber for supplying a spray of water cooler than the air entering therein from the inlet chamber; and

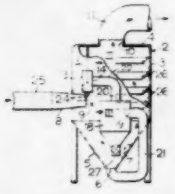
a mist eliminator mounted above the spray means in the housing, said eliminator comprising a mesh layer through which the air flows before leaving the outlet chamber whereby incoming mine air is deflected to the spray chamber wherein cooler water is sprayed thereon to cool the air, said sprayed water falling through the flow of incoming air to further cool the air until the water is discharged into the water collecting means.

4,394,143

PROTECTIVE SPARK ELIMINATING SYSTEM FOR A FILTER BAGHOUSE

Leonard J. O'Dell, Louisville, Ky., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jul. 2, 1982, Ser. No. 394,851
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—261 **11 Claims**



1. A protective spark eliminating system for removing burning particulates from a hot gas stream, comprising:

a housing having an outer side wall defining a separating chamber within the housing, a top section enclosing the top of the housing, and a hopper having a bottom outlet enclosing the bottom of the housing;

a hot gas inlet duct spaced from the top section projecting through the side wall into the chamber providing a hot gas inlet for directing the hot gas stream into the chamber;

a gas outlet duct in the top section of the housing providing an outlet for directing the hot gas stream out of the chamber; and

a secondary gas system adapted to circulate a secondary gas stream through the chamber including a blower having a gas inlet and a gas outlet, a gas nozzle connected to the outlet of the blower aligned above thegas inlet duct adapted to maintain a localized gas curtain flowing downwardly across the width of the hot gas inlet, an inertial separator having a gas inlet and a gas outlet, means connecting the gas inlet of the inertial separator to the outlet of the hopper, and means connecting the outlet of the inertial separator to the inlet of the blower; whereby

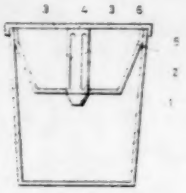
burning particulates in the hot gas stream are directed downwardly by the gas curtain as the hot gas stream enters the separating chamber whereafter the downwardly descending particulates are entrained in the secondary gas stream as it flows to the inertial separator where the particulates are removed from the gas stream which is in turn drawn into the inlet of the blower and directed bacl. to the separating chamber.

4,394,144

DEHUMIDIFYING CONTAINER

Yoshio Aoki, Koga, Japan, assignor to Kaken Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 3, 1981, Ser. No. 299,263
Int. Cl.³ B01D *53/14, 53/26*
U.S. Cl. 55—281 **8 Claims**



3. A dehumidifier, comprising:

a dehumidifying agent;

an outer container; and

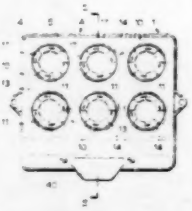
an inner container having an upper end and a bottom portion interconnected with a side wall, said inner container containing said dehumidifying agent therein, said inner container having an opening at its upper end and a discharge pipe provided upright from a center of said bottom portion, said discharge pipe having at least one slit which continuously extends in a longitudinal direction of said pipe in a wall thereof and along a substantial length of said wall, said discharge pipe having respective openings at its upper and lower ends, said inner container being detachably fitted into said outer container in such a manner that a space having a predetermined volume is formed between said bottom portion of said inner container and a bottom portion of said outer container.

4,394,145

AIR CLEANERS

Jarl Sundseth, 23 Lennox Gardens, London, S.W. 1, England

Filed Jul. 21, 1981, Ser. No. 285,474
Int. Cl.³ B01D *45/12*
U.S. Cl. 55—347 **7 Claims**



1. An air cleaner comprising a shallow housing having a first outer end wall and a second inner end wall, said inner and outer end walls connected by a peripheral wall, a plurality of tubular dust separator elements arrayed in the housing for generally straight through flow of air across the thickness of said housing, wherein

each separator element comprises

a tubular portion having inner and outer generally cylindrical surfaces,

an annular inlet generally defined by said first outer end wall of said housing, said inlet further defined by an annular inlet wall and a central dome,

the inner surface of said tubular portion being of greater diameter than the inlet wall,

inclined vanes connecting said annular inlet wall and said central dome adapted to impart spin to dust-laden air entering said inlet,

an air outlet generally defined by said second, inner end wall of said housing, said wall having an annular portion extending from the surface thereof toward said air inlet,

said air outlet of smaller diameter than said inlet and coaxial with said inlet and the inner surface of said tubular portion,

an annular space remote to said inlet defined by at least the inner surface of said tubular portion and by the annular inwardly extending portion of the inner housing wall,

a circumferential dust exit defined in said tubular portion adjacent to said annular space, said exit extending over a limited arc within the range 45° to 90°,

the housing defines about the separator elements a closed dust collection chamber, said chamber containing means for guiding flow of air in said chamber, the guide means including the generally cylindrical outer surface of said tubular portion, and

the vanes of the plurality of separator elements being inclined so as to impart left- or right-handed spin to air passing therethrough, with elements having vanes adapted to impart left-handed spin positioned adjacent to elements having vanes adapted to impart right-handed spin in said array of elements,

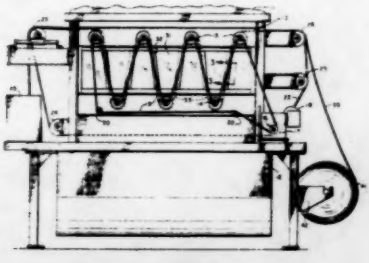
whereby dust-laden air entering a first separator element through said air inlet is imparted with left- or right-handed spin and enters said annular space, the circulating air mass in the annular space inducing at the exit a corresponding circulation of an air mass in the dust collection chamber surrounding said first separator element, the opposite direction of flow being imparted to air flow in adjacent separator elements and thereby in the air masses surrounding said adjacent elements reinforcing the circulating flow in the closed dust collection chamber, dust in the spinning air flow mass in the annular space of said first element is directed toward the inner surface of the tubular portion by the imparted spin and held in suspension by the air mass circulating in the annular space, air substantially free of dust leaves said separator element via said air outlet, and dust in the air flow mass passing the exit is separated from the air flow mass in said annular space remote to said inlet by centrifugal force with a radial velocity component and enters the air flow mass in the surrounding dust collection chamber, the dust collection chamber being closed so substantially no air flows through the exit between the separator element and the dust collection chamber.

4,394,146

FILTER APPARATUS

Max Klein, Shrewsbury, N.J., assignor to Crane & Co., Inc., Dalton, Mass., a part interest

Filed Sep. 29, 1981, Ser. No. 306,694
Int. Cl.³ B01D *46/18*
U.S. Cl. 55—354 **10 Claims**



1. A roll type filter apparatus having a filter chamber with an inlet for receiving gaseous medium, an outlet for discharging filtered gaseous medium, said filter chamber having opposite side walls defining between them a path for the gaseous medium from said inlet to said outlet, a filter medium spanning across said filter chamber between said side walls and having opposite edge portions disposed adjacent the respective side walls, said filter medium comprising a support grid and a filter mat substantially co-extensive with said support grid, and means to guide said medium in a predetermined path through said filter chamber with one surface facing upstream toward said inlet and the opposite surface facing downstream toward said outlet, said support grid being on the downstream side of said filter mat;

flange means projecting inwardly of said chamber from said sidewalls, said flange means being disposed on said opposite side walls in alignment with said predetermined path to underlie the edge portions of said filter medium on the downstream or outlet side of said filter medium and occupy the space between said filter medium and said side walls, and having a series of apertures disposed in longitudinally-spaced relation along the length of said flange means;

means to advance said filter medium longitudinally through said filter chamber between said flange means with the side edges of said filter medium overlying the free edges of said flange means; and

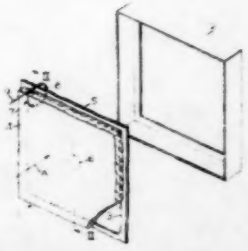
means to assemble the mat of said filter medium onto said support grid and feed the assembled filter medium into the filter chamber with the opposite edge portions overlying the upstream surface of the respective flange means including the series of apertures, said apertures operable to provide fluid communication between the filter chamber outlet and the upstream surface of said flange means in the area where said medium is in overlying relation therewith to effect intimate engagement therebetween, whereby gaseous medium flowing through said filter chamber must pass through said filter medium in its travel from said inlet to said outlet.

4,394,147

INTERNALLY SUPPORTED FILTER

John A. Caddy, and William A. Putman, both of Louisville, Ky., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 30, 1981, Ser. No. 325,756
Int. Cl.³ B01D *46/10*
U.S. Cl. 55—357 **5 Claims**



1. An internally supported composite filter having a single handle adapted to be removably secured in a flow-through mounting structure for separating particulate materials from a gas stream flowing through the mounting structure, comprising:

a closed loop of relatively rigid material forming a thin wire-like frame having a pair of opposing side portions;

two confronting sheets of filter media having substantially the same peripheral shape as said frame and being secured thereto, said frame being positioned between said sheets inwardly of their outer peripheries;

fastening means securing said sheets together in a relatively

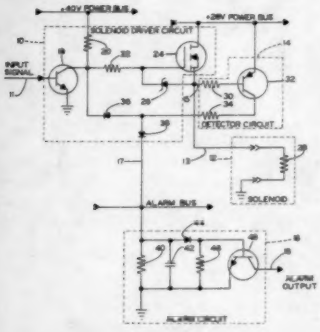
uncompacted fashion proximate the center of the sheets to retard bulging of the filter during filtering operations; and said handle being formed of a flexible strip, said handle having one end secured to one of said side portions and a free end adapted to be grasped by a workman to accommodate removing the filter by pulling the strip which causes the filter to pivot about the other side portion to peel it out of the mounting structure in a pivotal sliding fashion, thereby essentially minimizing shaking of the filter when the workman removes it from the mounting structure.

4,394,148

SHORT CIRCUIT PROOF DRIVER AND ALARM CIRCUIT FOR A SOLENOID IN A GLASSWARE FORMING MACHINE

William H. Ryan, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 26, 1981, Ser. No. 314,607
Int. Cl.³ C03B *9/40*
U.S. Cl. 65—159 **18 Claims**



1. In a glassware forming machine including at least one forming means for forming articles of glassware, the forming means including an actuator having a first electrical characteristic when functioning in a normal operating mode and a second electrical characteristic when in a failure operating mode and a source of power connectable to the actuator, a self-protecting driver circuit for selectively actuating the actuator comprising: driver means for selectively connecting the actuator to the source of power whereby the actuator is energized in the normal operating mode; said driver means having an active element for limiting the amount of electrical current drawn therethrough to a predetermined amount when the forming means is short-circuited whereby the actuator remains energized in the failure operating mode.

4,394,149

PLANT NUTRIMENT COMPOSITIONS AND METHOD OF THEIR APPLICATION

Francis C. Szoka, Jr., 76 Summit St., Waltham, Mass. 02154, and Demetrios P. Papahadjopoulos, 3170 Condit St., Lafayette, Calif. 94549

Continuation-in-part of Ser. No. 881,116, Feb. 24, 1978, Pat. No. 4,235,871. This application May 13, 1980, Ser. No. 149,516
Int. Cl.³ C05C *9/00*
U.S. Cl. 71—28 **8 Claims**

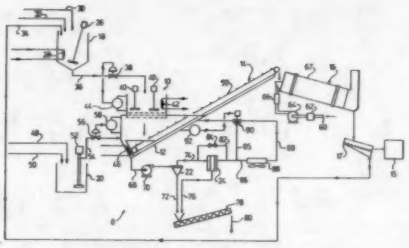
1. A method of providing nutriments to agricultural plants possessing plant cells having cell walls and cell membranes, which comprises; applying to the plant a nutritional amount of a plant nutriment, encapsulated in a lipid vesicle, whereby the lipid vesicle encapsulating the plant nutriment is taken up by the plant and passes into the plant cell where the lipid vesicle is broken down and releases the encapsulated plant nutriment.

4,394,150

SULPHUR-CLAY PRILLS

Barney D. Garrison, Jr., and Barry S. Marjanovich, both of Calgary, Canada, assignors to Canadian Superior Oil Ltd., Calgary, Canada

Filed Jan. 29, 1981, Ser. No. 229,642
Claims priority, application Canada, Feb. 29, 1980, 346710
Int. Cl.³ C05G *3/04*
U.S. Cl. 71—62 **26 Claims**



1. A process for producing substantially spherical, water degradable, sulphur-clay particles comprising:

passing at least one stream of a mixture comprising molten sulphur and a particulate swelling clay into an aqueous solution of a water soluble electrolyte salt, said solution comprising about 5 to 15%, by weight, of said salt and about 85 to 95%, by weight, of water,

maintaining said solution at a temperature effective to cool said mixture below its solidification temperature,

allowing the surface tension of the molten sulphur to break up said stream in said solution to form substantially spherical droplets and allowing said droplets to cool and solidify in said solution to form said substantially spherical particles,

withdrawing said particles from said solution and drying said particles.

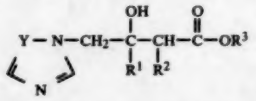
4,394,151

AZOLYL-HYDROXY ALKANOIC ACID COMPOUNDS

Paul de Fraine, Wokingham; John M. Clough, High Wycombe, and Paul A. Worthington, Maidenhead, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 29, 1981, Ser. No. 288,203
Claims priority, application United Kingdom, Aug. 22, 1980, 8027451
Int. Cl.³ A01N *43/50, 43/64;* C07D *233/60, 249/08*
U.S. Cl. 71—76 **7 Claims**

1. A racemic compound having the general formula (I):



and stereoisomers thereof, wherein R^1 is a straight or branched chain alkyl group having from 1 to 6 carbons, phenyl or phenyl substituted with halogen, alkyl, alkoxy, nitro, phenyl or phenoxy; R^2 and R^3 are together a $—CH_2—CH_2—$ bridging group, or each represents hydrogen, straight or branched chain alkyl groups having from 1 to 6 carbon atoms, phenyl or benzyl or phenyl or benzyl substituted with halogen, alkyl or alkoxy of 1 to 6 carbons, nitro, phenyl or phenoxy, the alkyl moiety of the benzyl being unsubstituted or substituted with

alkyl of from 1 to 6 carbons; and Y is =N— or =CH—, and acid addition salts, alkyl, aralkyl or aryl ethers, alkanoate esters and metal complexes thereof.

6. A method of combating fungal diseases in a plant, which comprises applying to the plant, to seed of the plant, or to the locus of the plant or seed, a fungicidally effective amount of a compound as defined in claim 1.

7. A method of regulating plant growth which comprises applying to the plant, to seed of the plant, or to the locus of the plant or seed, a plant growth regulating amount of a compound as defined in claim 1.

4,394,152

SULFUR-CONTAINING OXIME COMPOUNDS FOR PROTECTING CULTIVATED PLANTS

Elmar Sturm, Aesch; Heinrich Schempp, Arlesheim, and Henry Martin, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

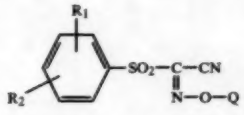
Division of Ser. No. 68,123, Aug. 20, 1979, Pat. No. 4,278,613. This application May 4, 1981, Ser. No. 260,534

Claims priority, application Switzerland, Aug. 28, 1978, 9081/78

Int. Cl.³ A01N *37/34*

U.S. Cl. 71—77 **86 Claims**

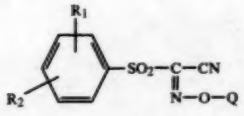
37. A method for protecting crops from injury caused by application of a herbicide, said method comprising applying to the crop seeds a crop protecting amount of a compound of the formula



wherein

each of R_1 and R_2 is hydrogen, halogen or C_1–C_4 alkyl, and Q is a hydrogen, a metal cation or a C_1–C_4 alkyl.

44. A method for protecting plants from injury caused by application of a herbicide, said method comprising dipping the roots of the seedlings of said plants into a solution comprising a crop protecting effective amount of a compound of the formula



wherein

each of R_1 and R_2 is hydrogen, halogen or C_1–C_4 alkyl, and Q is hydrogen, a metal cation or a C_1–C_4 alkyl group.

4,394,153

HERBICIDAL ARYL ESTERS OF N-[(HETEROCYCLIC)-AMINOCARBONYL]SULFAMIC ACID

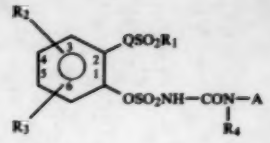
James J. Reap, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 168,345, Jul. 11, 1980, abandoned. This application May 18, 1981, Ser. No. 261,751

Int. Cl.³ A01N *9/22*; C07D *239/32*

U.S. Cl. 71—92 **28 Claims**

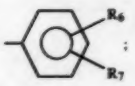
1. A compound of the formula:



where

Q is O or NR_5;

R_1 is C_1–C_4 alkyl, C_1–C_4 alkyl substituted with 1–3 atoms of F, Cl or Br, $CH_2CH_2OCH_3$, $CH_2CH_2CH_2OCH_3$ or



R_2 is H, F, Cl, Br, OCH_3, NO_2 or C_1–C_2 alkyl;

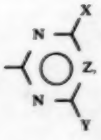
R_3 is H, F, Cl, Br or CH_3;

R_4 is H, CH_3 or OCH_3;

R_5 is C_1–C_4 alkyl;

R_6 and R_7 are independently H, F, Cl, Br, CH_3, CF_3, NO_2 or OCH_3;

A is



X is NH_2, $N(CH_3)_2$, $NHCH_3$, C_1–C_4 alkyl, CH_2OCH_3, $CH_2OC_2H_5$, C_1–C_3 alkoxy, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, OCH_2CF_3 or C_1–C_3 alkyl substituted with 1–3 atoms of F, Cl or Br;

Y is H, CH_3, OCH_3 or Cl;

Z is CH, CCH_3, CBr, CCl, CF or Cl

provided that:

(1) when Y is Cl, then Z is CH and X is NH_2, $NHCH_3$, $N(CH_3)_2$, CH_3 or OCH_3; and

(2) when Y is H, then X is OCH_3, CH_3 or CH_2OCH_3, and Z is CH, CCH_3, CBr, CCl, CF or Cl.

4,394,154

SUBSTITUTED PYRIDYLOXYBENZO-2,1,3-OXADIAZOLES AND -THIADIAZOLES AND N-OXIDES THEREOF

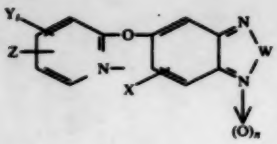
Richard J. Anderson, Palo Alto, and Michael M. Leippe, Boulder Creek, both of Calif., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Feb. 22, 1982, Ser. No. 351,070

Int. Cl.³ C07D *498/04, 513/04*; A01N *43/40*

U.S. Cl. 71—92 **6 Claims**

1. A compound of the formula:



wherein,

n is zero or one;

t is zero, one or two;

W is oxygen or sulfur; and

each of Y and Z is independently selected from hydrogen, lower alkyl, lower haloalkyl, lower alkoxy, lower alkylthio, lower alkoxycarbonyl, acetyl, halogen, cyano, nitro and X is hydrogen.

6. A method for the control of weeds which comprises treating said weed or its locus with an herbicidally effective amount of a compound of the formula as defined in claim 1.

4,394,155

SUBSTITUTED PYRIDINE 1-OXIDE HERBICIDES

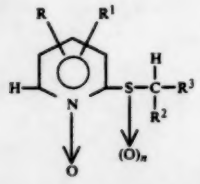
Howard L. Plant, Milford; Steven E. Cantor; Arthur M. Doweyko, both of Cheshire, all of Conn.; Mark A. Dekeyser, Waterloo, Canada, and Allyn R. Bell, Cheshire, Conn., assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Ontario, Canada

Filed Feb. 5, 1981, Ser. No. 231,813

Int. Cl.³ A01N *43/40*; C07D *213/64*

U.S. Cl. 71—94 **20 Claims**

1. A compound having the structural formula



wherein R and R^1 may be the same or different and are C_1 to C_4 alkyl, C_1 to C_4 alkoxy, phenyl or halogen provided that R or R^1 is not halogen if attached in the 3-position of the pyridine ring, and R or R^1 may further be hydrogen provided that one of them is one of the recited moieties other than hydrogen; R^2 is hydrogen, halogen, methyl or ethyl; R^3 is phenyl or phenyl substituted with halogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, or nitro; and n is 1 or 2.

19. A herbicidal composition comprising a compound of any of claims 1 to 18 in a herbicidally effective amount in admixture with a carrier therefor.

20. A herbicidal method comprising applying, to a locus at which it is desired to control weeds, a herbicidally effective amount of a compound as in any of claims 1 to 18.

4,394,156

NOVEL N-PHENYL-SUBSTITUTED N-HETEROCYCLIC COMPOUNDS, THEIR PREPARATION AND USE IN AGENTS FOR REGULATING PLANT GROWTH

Hans Tobler, Allschwil; Werner Föry, Basel, and Rolf Schurter, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

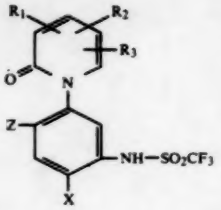
Continuation-in-part of Ser. No. 111,517, Jan. 14, 1980, abandoned, which is a division of Ser. No. 896,970, Apr. 12, 1978, Pat. No. 4,208,202. This application Oct. 26, 1981, Ser. No. 314,620

Claims priority, application Switzerland, Apr. 15, 1977, 4702/77; Nov. 9, 1977, 13661/77

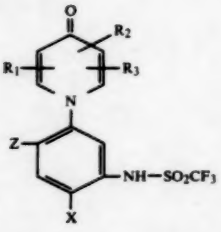
Int. Cl.³ A01N *43/40*; C01D *213/62*; C07D *213/64*, *213/68*

U.S. Cl. 71—94 **8 Claims**

1. A compound of the formulae Ia or Ib.



(Ia)



(Ib)

or a salt thereof formed with a cation selected from the group consisting of alkali metals, alkaline earth metals, zinc, copper, iron and organic amines, in which formulae

R_1, R_2 and R_3 independently of one another are hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, alkoxycarbonyl having 1 to 4 carbon atoms in the alkyl portion, carboxyl, halogen or cyano, and

X and Z independently of one another are hydrogen, C_1–C_4 alkyl, C_1–C_5 alkoxy or halogen.

6. A composition for regulating plant growth which contains, in addition to carrier materials, an effective plant growth regulating amount of at least one trifluoromethanesulphonamido-phenyl-substituted heterocyclic compound according to claim 1 as the active component.

4,394,157

PYRIDYL-2-OXYPHENYLOXIME DERIVATIVES AND THEIR USE AS HERBICIDES

Georg Pissiotas, Lörrach, Fed. Rep. of Germany, and Hermann Rempfler, Ettingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

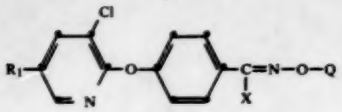
Division of Ser. No. 172,575, Jul. 28, 1980, Pat. No. 4,322,241. This application Jan. 19, 1982, Ser. No. 340,676

Claims priority, application Switzerland, Aug. 7, 1979, 7230/79

Int. Cl.³ C07D *213/64*; A01N *43/40*

U.S. Cl. 71—94 **4 Claims**

1. A compound of the formula



wherein
R_1 is halogen or trifluoromethyl,
X is methyl or cyano, and
Q is lower cyanoalkyl.

3. A method of selectively controlling weeds in crops of cultivated plants, which comprises applying to said crops a herbicidally effective amount of a compound of claim 1.

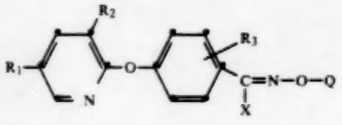
4,394,158

PYRIDYL-2-OXYPHENYLOXIME DERIVATIVES, AND THEIR USE AS HERBICIDES

Georg Pissiotas, Lörrach, Fed. Rep. of Germany, and Hermann Rempfler, Ettingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 172,575, Jul. 28, 1980, Pat. No. 4,322,241. This application Jan. 19, 1982, Ser. No. 340,678
Claims priority, application Switzerland, Jul. 8, 1979, 7230/79
Int. Cl.³ C07D 213/64; A01N 43/40
U.S. Cl. 71—94 8 Claims

1. A compound of the formula



wherein
R_1 is halogen or trifluoromethyl,
each of R_2 and R_3 is hydrogen or halogen,
X is methyl or cyano, and
Q is methylcarbamoyl, phenylcarbamoyl or di-chloro-phenyl carbamoyl.

8. A method of selectively controlling weeds in crops of cultivated plants, which comprises applying to said crops a herbicidally effective amount of a compound of claims 1, 2 or 6.

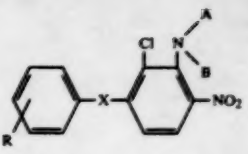
4,394,159

2-CHLORO-3-(PHENOXY OR PHENYLTHIO)-6-6-NITRO -ANILINES

Wolfgang Buck; Richard Sehring; Gerbert Linden, all of Ingelheim, and Sigmund Lust, Darmstadt, all of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim, Fed. Rep. of Germany

Continuation of Ser. No. 185,799, Sep. 10, 1980, abandoned, which is a continuation of Ser. No. 127,367, Mar. 4, 1980, abandoned, which is a continuation of Ser. No. 57,500, Jul. 13, 1979, abandoned. This application Mar. 13, 1981, Ser. No. 243,385
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1978, 2831262
Int. Cl.³ E05B 65/08, 63/14; C07C 149/42, 87/60
U.S. Cl. 71—98 6 Claims

1. A compound of the formula



wherein
A is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, chloro-(alkyl of 2 to 6 carbon atoms), hydroxy-(alkyl of 2 to 6 carbon atoms) or allyl;
B is alkyl of 1 to 3 carbon atoms;
R is hydrogen, fluorine, chlorine, bromine, methyl or methoxy; and
X is oxygen or sulfur.

4,394,160

MAKING MAGNETIC POWDERS

Walter O. Freitag, Dresher, and Victor V. Suchodolski, Erdenheim, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 3, 1979, Ser. No. 99,365
Int. Cl.³ C22C 1/04; H01F 1/02
U.S. Cl. 75—0.5 AA 7 Claims

1. A method of producing magnetic powders having a coercive force in the range of from about 300 Oe to 700 Oe for use in the manufacture of magnetic recording media which comprises:
(a) pre-determining the desired coercive force of said magnetic powders,
(b) preparing a solution of metal salt capable of forming a ferromagnetic material,
(c) maintaining the solution of Step (b) at a pre-selected temperature which is functionally determinate of the desired coercive force, said pre-selected temperature being within a range of from about 0° C. to 50° C.,
(d) preparing a solution of a borohydride reducing agent,
(e) maintaining the solution of Step (d) at a pre-selected temperature which is functionally determinate of the desired coercive force, said pre-selected temperature being within a range of from about 0° C. to 50° C.,
(f) mixing the solutions of Steps (c) and (e) together while applying a magnetic field of a selected magnitude to said mixture during the reducing reaction between said solutions, the temperatures of said reactant solutions of Steps (c) and (e) prior to the mixing being pre-selected so as to control the coercive force of the magnetic powder produced from the mixture of Step (f).

4,394,161

METHOD OF PRODUCING A VANADIUM- AND NITROGEN-CONTAINING MATERIAL FOR USE AS AN ADDITION TO STEEL

Roy R. Hannum, Long Bottom, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 28, 1982, Ser. No. 393,228
Int. Cl.³ C22B 34/00
U.S. Cl. 75—0.5 BC 1 Claim

1. A method for making a material containing vanadium and nitrogen substantially in the form of V_2N, said method comprising:
(i) providing a mixture of V_2O_3 and carbon in substantially stoichiometric proportions in accordance with the following formula:

$$V_2O_3 + 3C \rightarrow 2V + 3CO$$

(ii) subjecting the mixture in a furnace to a temperature in the range of about 1000° C. to 1500° C. under a reduced

pressure in the range of about 5 mm to 100 microns to cause reaction between mixture constituents and the evolution of CO;

(iii) continuously maintaining the temperature and pressure in the furnace in the respective ranges specified in (ii) while simultaneously and continuously introducing nitrogen gas into the furnace to provide a nitrogen atmosphere in the furnace until CO is essentially no longer evolved from the mixture; and

(iv) subsequently cooling the mixture in a nonoxidizing environment.

4,394,162
TREATMENT OF MATTER IN LOW TEMPERATURE PLASMAS

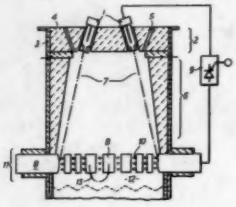
Jozef K. Tylko, Stoneleigh, England, assignor to Plasma Holdings N.V., Curacao, Netherlands Antilles

Division of Ser. No. 138,693, Apr. 9, 1980. This application Apr. 23, 1982, Ser. No. 371,320

Claims priority, application United Kingdom, Apr. 17, 1979, 7913337

Int. Cl.³ C22D *7/00*

U.S. Cl. 75—10 R **20 Claims**



1. A method of treating particulate matter with low temperature plasma, comprising the steps of:

(a) producing an electrical arc discharge between spaced stationary electrode structures at least one of which is annular;

(b) causing at least 50 Hz frequency changes in the power and circulation in the distribution of the discharge about the peripheries of the or each annular electrode structure to produce a region of plasma in the interelectrode space; and

(c) introducing entrained particulate matter into the plasma region created thereby.

4,394,163
PROCESS FOR THE MANUFACTURE OF CRUDE IRON AND SYNTHESIS GAS

Per H. Collin, Stocksund, Sweden, assignor to Asea AB, Västeras, Sweden

Filed Jun. 19, 1981, Ser. No. 275,325

Claims priority, application Norway, Jun. 23, 1980, 801878

Int. Cl.³ C21C *5/52*

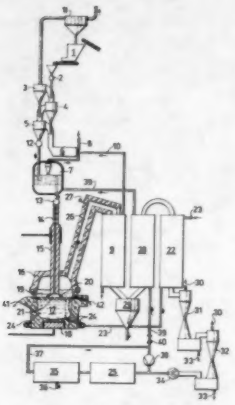
U.S. Cl. 75—11 **7 Claims**

1. A process for converting an iron oxide into crude iron which comprises: I. introducing in an arc furnace, a fine-grained material essentially containing iron oxide into a plasma zone between an electrode and a melt surface of a crude iron melt, and II. injecting a gaseous or volatile hydrocarbon into said crude iron melt at a depth of at least 30 cm below the surface thereof, comprising:

a.1 preheating the iron oxide-containing material, or said iron oxide-containing material in admixture with adjusted quantities of slag formers, by means of combustion gases from burning the gases from the prereduction according to a.2 or supplementally with other fuels;

a.2 prereducing the preheated concentrate according to a.1;

a.3 introducing the concentrate prereduced according to a.2 in the plasma zone below the electrode in an arc furnace of a direct current type, said furnace containing a crude iron melt, the temperature of said melt, by means of adjused supply of electrical enerby to the arc, is maintained over 1200° C., and the content of dissolved carbon in said melt is maintained above 2% by injecting suitably preheated hydrocarbons into the crude iron melt at a depth exceeding 30 cm below the surface of the melt;



a.4 precooling the gases leaving the arc furnace by introducing directly into the leaving gases an adjusted flow of coolant, or a mixture of natural gas and water vapor, and

a.5 recovering a substantial part of the physical heat content of the precooled gases, and purifying from dust said precooled gases by scrubbing.

4,394,164
PROCESS FOR REMOVAL OF HARMFUL IMPURITIES FROM METALLURGICAL SULPHIDE MELTS

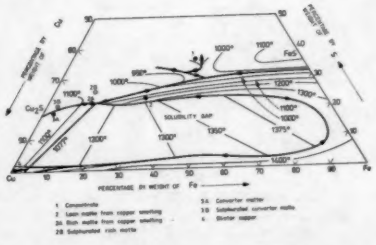
Juho K. Mäkinen, Vanha-Ulvila, and Kaarina M. E. Käenniemi, Noormarkku, both of Finland, assignors to Outokumpu Oy, Outokumpu, Finland

Filed Sep. 25, 1981, Ser. No. 305,508

Claims priority, application Finland, Sep. 26, 1980, 803052

Int. Cl.³ C21B *1/04*; C22B *1/02*

U.S. Cl. 75—21 **10 Claims**



1. A process for the removal from metallurgical sulphide melts of harmful impurities selected from the group consisting essentially of arsenic, antimony, bismuth and lead, comprising sulphurating the sulphide melt in an inert gas atmosphere by feeding into the melt a sulphur containing agent in an amount such that the sulphur supplied to the sulphide melt is at least 10% in excess of the stoichiometric sulphur amount as calculated from the sulphur requirement of the principal components of the melt.

4,394,165

METHOD OF PRELIMINARY DESILICONIZATION OF MOLTEN IRON BY INJECTING GASEOUS OXYGEN

Shingo Satoh; Takashi Inoue; Minoru Naki, and Yuji Kawauchi, all of Muroran, Japan, assignors to Nippon Steel Corporation, Japan

Filed Nov. 30, 1981, Ser. No. 325,999
Claims priority, application Japan, Aug. 19, 1981, 55-129609
Int. Cl.³ C21C 7/00
U.S. Cl. 75—60 11 Claims

1. A method of preferential desiliconization of molten iron by injecting gaseous oxygen wherein the gaseous oxygen is injected into the molten iron at controlled a rate depending upon the silicon content of the molten iron so as to satisfy the formula (I):

$$0.03 \leqq V_{O2} \leqq 1.25\ [\%Si] - 0.075 \quad (I)$$

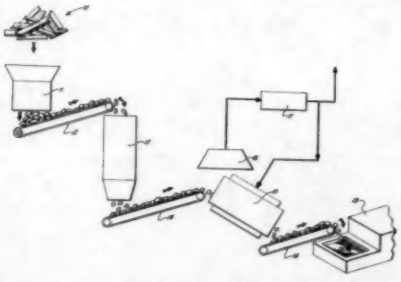
wherein V_{O2}: the rate of gaseous oxygen feed Nm^3/min/ton pig,) and [%Si]: Si content of the molten iron (%).

4,394,166

SCRAP METAL RECOVERY PROCESS

James A. Kennedy, Newnan, Ga., assignor to The William L. Bonnell Company, Newnan, Ga.

Filed May 28, 1982, Ser. No. 382,880
Int. Cl.³ C22B 21/00
U.S. Cl. 75—65 R 9 Claims



1. Method for recycling aluminum scrap containing thermal barrier material, said method comprising the steps of:

(a) comminuting said scrap to pieces from about 18 to about 4 inches in length thereby preparing a relatively uniformly sized aluminum scrap product;

(b) conveying said comminuted aluminum scrap product to a storage hopper;

(c) continuously feeding the comminuted aluminum scrap product from said storage hopper to an indirect-fired rotary kiln;

(d) heating said scrap product in said indirect-fired rotary kiln to a temperature of about 800° to 900° F. for a period of about one-half to one hour thereby substantially completely removing said thermal barrier material as combustible gas and cinder producing a satisfactory aluminum melt furnace feed product;

(e) collecting and burning said combustible gases and smoke in a waste heat recovery afterburner to provide heating values for said step (d);

(f) transferring heating values provided in step (e) to said indirect-fired rotary kiln; and,

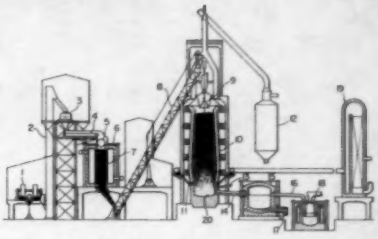
(g) feeding said feed product from said indirect-fired rotary kiln to an aluminum melt furnace for melting.

4,394,167

METHOD OF CARBOTHERMICALLY PRODUCING ALUMINUM

Kenshi Kuwahara, Kanagawa, Japan, assignor to Mitsui Aluminum Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1981, Ser. No. 241,053
Claims priority, application Japan, Apr. 22, 1980, 55-53374
Int. Cl.³ C22B 21/02
U.S. Cl. 75—68 A 13 Claims



1. A method of carbothermically producing an aluminum metal from alumina, silica and iron-oxide bearing materials, which comprises;

(a) providing briquettes of a mix of said materials and a carbonaceous material which contains a sufficient amount of carbon to reduce the oxides in the material and coking said briquettes at a temperature of 600° to 900° C. by direct contact with non-oxidizing gas, to form coked briquettes,

(b) heating the coked briquettes to a temperature of 2,000° to 2,100° C. with gas for combustion to form an aluminum-silicon-iron alloy,

(c) scrubbing the resulting alloy in the nascent state with a molten lead splash to preferentially absorb the aluminum in the alloy into the molten lead,

(d) separating the silicon and iron of the alloy from the aluminum-absorbed molten lead,

(e) cooling the aluminum-absorbed molten lead to cause it to separate into liquid layers of aluminum and lead, respectively, and

(f) subjecting the aluminum layer to distillation to distill off lead present and recover aluminum metal in substantially pure form.

4,394,168

AUSTENITIC WEAR RESISTANT STEEL

Tor Hartvig, and Petter Fjellheim, both of Raufoss, Norway, assignors to A/S Raufoss Ammunisjonsfabrikker, Raufoss, Norway

Filed Feb. 2, 1981, Ser. No. 230,630
Claims priority, application Norway, Jul. 7, 1980, 802044
Int. Cl.³ C22C 38/38
U.S. Cl. 75—126 A 9 Claims

1. An austenitic wear resistant steel having good wear resistance and serviceability when subjected to abrasive and com-

bined abrasive stresses and impact stresses consisting essentially of, in percentage by weight:

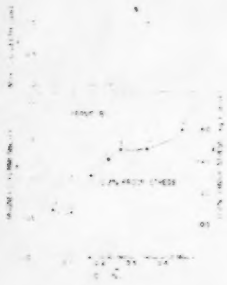
16.–25.	Mn
1.0–2.0	C
0.5–5.0	Cr
0.2–2.0	Si
0.1–0.5	Ti
0.3–4.0	Mo
0.0–0.5	one or more of Ce, Sn, V, W or Nb (Cb)
0.0–5.0	Ni
0.0–5.0	Cu
0.0–0.1	P (impurity)
0.0–0.1	S (impurity)
remainder to 100%	Fe.

4,394,169

HIGH STRENGTH AUSTENITE STEEL HAVING EXCELLENT COLD WORK HARDENABILITY

Koji Kaneko; Yoshihide Fuchino, and Tsuyoshi Inoue, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 13, 1982, Ser. No. 377,842
Claims priority, application Japan, May 15, 1981, 56-72997
Int. Cl.[1] **C22C** *38/02*
U.S. Cl. 75—128 A **3 Claims**



1. High strength austenitic steel having excellent cold work hardenability, consisting essentially of the following elements:
C . . . 0.1–0.3 wt.%;
Si . . . a positive amount and up to 1.5 wt.%;
Mn . . . 16–22 wt.%;
Cr . . . 14–18 wt.%;
V . . . 0.8–1.7 wt.%;
N . . . 0.3–0.6 wt.%;
Ni . . . less than 0.8 wt.%; and
Fe and inevitable impurities . . . balance,
with a proviso that the C-, N- and V-contents satisfy the following inequalities:
$C+N-(V/10)\geqq 0.4$ wt.%; and
$C+N+(V/5)\geqq 0.75$ wt.%.

4,394,170

COMPOSITE SINTERED COMPACT CONTAINING HIGH DENSITY BORON NITRIDE AND A METHOD OF PRODUCING THE SAME

Akira Sawaoka, Yokohama; Masatada Araki, Handa; Shinroku Saito, Yokohama, and Tamotsu Akashi, Aichi, all of Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo, Japan

Filed Nov. 14, 1980, Ser. No. 206,700
Claims priority, application Japan, Nov. 30, 1979, 54/154245
Int. Cl.[3] **B22F** *3/14*; **C22C** *29/00*
U.S. Cl. 75—233 **2 Claims**

1. A composite sintered compact consisting of 15–60% by volume of high density boron nitride and the remainder being a cermet, said high density boron nitride consisting of 4–16% by volume of zincblende-type boron nitride and 96–84% by volume of wurtzite-type boron nitride, and said cermet consisting of 70–95% by volume of at least one ceramic material selected from the group consisting of aluminum nitride, magnesium nitride, titanium nitride, silicon nitride, chromium nitride, hafnium nitride, zirconium nitride, tantalum nitride, molybdenum nitride, niobium nitride, vanadium nitride, aluminum oxide, yttrium oxide, zirconium oxide, titanium boride, zirconium boride, hafnium boride, tungsten boride, tantalum boride, chromium boride, molybdenum boride, titanium carbide, boron carbide, chromium carbide, silicon carbide, hafnium carbide, zirconium carbide, vanadium carbide, tungsten carbide, niobium carbide, tantalum carbide and mixtures and solid solutions thereof; and 30–5% by volume of at least one metal selected from the group consisting of nickel, cobalt, chromium, manganese, iron, molybdenum, tungsten, vanadium, aluminum, magnesium, silicon, titanium, zirconium and hafnium, said composite sintered compact having a Vickers hardness not higher than about 2,680 kg/mm^2.

4,394,171

THICK FILM CONDUCTOR COMPOSITIONS

Kumaran M. Nair, East Amherst, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 289,114, Aug. 3, 1981, abandoned. This application Mar. 10, 1982, Ser. No. 354,814
Int. Cl.[3] **C09D** *5/24*
U.S. Cl. 106—1.14 **10 Claims**

1. A palladium/silver metallization suitable for the manufacture of printed terminations, which is an admixture of:
A. 50–95% by weight finely divided particles of metallic materials comprising by weight
(1) 6 to 60 parts palladium metal;
(2) 94 to 40 parts silver metal or alloys thereof in the same proportions; and
B. 5–50% by weight finely divided particles of a bismuth-free low-melting, low viscosity devitrifiable glass comprising 50–80% by weight Pb_3O_4 and 10–30% GeO_2.

4,394,172

NON-DUSTING AND FAST-WETTING IMPRESSION MATERIAL AND METHOD OF PREPARING SAME

Max Scheuble, Zurich, and Paul Munsch, Oberhasli, both of Switzerland, assignors to Dentsply Research & Development Corp., Del.

Continuation-in-part of Ser. No. 181,417, Aug. 26, 1980, abandoned. This application Aug. 17, 1981, Ser. No. 293,143
Int. Cl.[3] **A61C** *9/00*; **C08L** *1/08, 5/04*
U.S. Cl. 106—38.5 D **6 Claims**

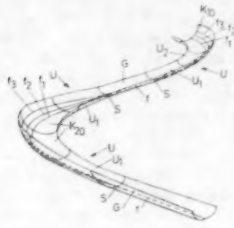
1. In a dry powdered impression material comprising an alginic acid salt component and a filler component, wherein said material exhibits a tendancy toward dusting in its dry powdered state, wherein said material is mixable with water to form an impression paste capable of setting to a solid, and wherein said material exhibits a further tendancy toward dusting upon admixture with water, the improvement comprising a coating on at least a portion of the powdered components rendering said material substantially non-dusting in its dry powdered form and during admixture with water, said coating being readily and rapidly wet, dispersed or dissolved by water and present in an amount of from about 1–10% by weight based on the total weight of the dry powdered components.

4,394,173

SPORTING AND RECREATIONAL FACILITY SLIDE

Christian Aste, Innsbruck, Austria, assignor to Horst Schwamm, Sistrans and Friedbert Pezzei, Grinzens, both of, Austria

Filed Apr. 28, 1981, Ser. No. 258,274
Claims priority, application Austria, May 5, 1980, 2368/80; May 5, 1980, 2372/80
Int. Cl.³ A63G 21/00, 25/00, 21/04
U.S. Cl. 104—69 7 Claims



1. A sporting or recreational slide, particularly for use with unsteered vehicles, said slide comprising:

a plurality of joined sections which form a sliding surface and which form regions which are, when viewed from above, straight regions, circular-arc regions and clothoid-shaped intermediate regions between and joining adjacent straight and circular-arc regions;

said intermediate region having a first end at said straight region and a second end at said circular-arc region; and

said sliding surface at the outer curved side of said intermediate region having a cross-sectional shape which continuously changes between said first and second ends, said cross-sectional shape at said first end comprising a quarter of an ellipse corresponding to the cross-sectional shape of said sliding surface at said straight region, and the ratio between the major axis and the minor axis of the ellipse continuously decreasing toward said second end.

4,394,174

PHOSPHATE CEMENT AND MORTAR

Ernst A. Tomic, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jun. 1, 1982, Ser. No. 383,453
Int. Cl.³ C04B 9/04
U.S. Cl. 106—85 18 Claims

1. A storable cement product containing (a) magnesium oxide in the form of particles which have a surface area of less than about 1 square meter per gram, and up to 90 percent of which pass through a 200-mesh screen and 10 percent of which are held on a 170-mesh or coarser screen; and (b) aluminum phosphate; components (a) and (b) being adapted to be combined with water and an inert aggregate of mixed particle sizes in amounts such as to form a mixture therewith comprising, by weight, about from 3 to 25 percent of component (a), about from 10 to 15 percent of component (b), about from 5 to 10 percent water, and about from 50 to 82 percent aggregate, and thereupon to undergo a reaction which raises the temperature of a 45-kilogram sample of the mixture to a peak temperature in the range of about from 40° to 90° C. at a rate such that said peak temperature is reached after the elapse of at least 10 minutes after the formation of said mixture.

4,394,175

SELF-LEVELLING CEMENTITIOUS MIXES

Leslie W. Cheriton, 3 Meadow Way Wing, Leighton Buzzard, Bedfordshire, LU7 OTG, and Philip J. Ansell, 20 Grove Way, Simpson, Milton Keynes, Buckinghamshire, both of England

Filed May 7, 1981, Ser. No. 261,325
Int. Cl.³ C04B 7/35
U.S. Cl. 106—90 14 Claims

1. A self-levelling screeding composition in the form of a free flowing paste, said composition comprising sand and other fillers, water, and hydraulic cement component comprising a portland cement and a high alumina cement characterized in that the cements are present in a weight ratio of 20–80:80–20 and in that the composition further includes a plasticiser component in a weight ratio of about 1% of the cement component to make the mix workable and sufficient of a set retarder component to delay the initial setting time about one hour.

4,394,176

METHOD OF PRODUCING SILICATE-CONTAINING GRANULATES

Hendrik Loggers, Amerongen, Netherlands, assignor to Aarding Weerstandlas B.V., Netherlands

Filed Jan. 21, 1982, Ser. No. 341,046
Int. Cl.³ C04B 15/13
U.S. Cl. 106—120 9 Claims

1. A method of producing calcium silicate-containing granulates by mixing a calcium oxide bound-containing product with a silicon-containing product, water and, if desired, a filler, subsequently forming granulates from said mixture by means of a heating treatment, while maintaining said granulates in a heated vapour atmosphere, wherein said heated vapour atmosphere is formed by having a heating fluid chosen from moist and non-moist heating fluids acting indirectly upon the granulates in such a way that any direct moisture condensation from the heating fluid upon the granulates is prevented.

4,394,177

COATING COMPOSITION

Akira Fujioka, Osaka; Kazuo Sakiyama, Ibaraki; Akio Takigawa, and Motoaki Yoshida, both of Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited and Nippon Sheet Glass Co. Ltd., both of Osaka, Japan

Filed Jan. 5, 1981, Ser. No. 222,565
Claims priority, application Japan, Jan. 10, 1980, 55-1532
Int. Cl.³ C09K 3/00
U.S. Cl. 106—287.14 12 Claims

1. A transparent, abrasion-resistant coating composition having high adhesiveness for transparent polymers, which comprises: as component (A), at least one hydrolyzate selected from the group of epoxy group-containing silicon compounds represented by the general formula (1):

$$R_a^1—\overset{\overset{R_b^2}{|}}{Si}—(OR^3)_{4-a-b} \quad (1)$$

wherein, R^1 stands for an organic group containing an epoxy group, R^2 for hydrogen atom, a hydrocarbon group having 1 to 6 carbon atoms or vinyl group, R^3 for a hydrocarbon group having 1 to 5 carbon atoms, alkoxyalkyl group or acyl group having 1 to 4 carbon atoms, a for an integer of 1 to 3 and b for an integer of 0 to 2, providing that $a+b \leqq 3$ is satisfied, said one hydrolyzate being used in an amount of 100 parts by weight (of solids; calculated as

$$R_a^1—\overset{\overset{R_b^2}{|}}{Si}—O_{\frac{4-a-b}{2}}),$$

as component (B), at least one member selected from the group

consisting of hydrolyzates of organic silicon compounds represented by the general formula (2):

$$R_c^4—Si—(OR^5)_{4-c} \quad (2)$$

wherein, R^4 stands for a hydrocarbon group having 1 to 6 carbon atoms, vinyl group, methacryloxy group, amino group, mercapto group, or organic group containing fluorine or chlorine, R^5 for a hydrocarbon group having 1 to 5 carbon atoms, alkoxyalkyl group or acyl group having 1 to 4 carbon atoms and c for an integer of 0 to 3; colloidal silica and organic titanium compounds, said one member being used in an amount within the range of from 1 to 567 parts by weight (of solids, calculated as $R_c^4—Si—O_{(4-c)/2}$ in the case of an organic silicon compound represented by the general formula (2), as SiO_2 in the case of colloidal silica or as $R_d^6—Ti—O_{(4-d)/2}$ in the case of an organic titanium compound, wherein R^6 stands for an unhydrolyzed group containing no hydroxy group and d for an integer of 1 to 4); and as component (C), a curing catalyst selected from the group consisting of ammonium perchlorate and ammonium chloride.

4,394,178

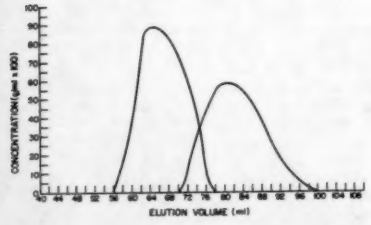
BULK LACTULOSE/LACTOSE SEPARATION BY SELECTIVE ADSORPTION ON ZEOLITIC MOLECULAR SIEVES

Chien C. Chao, Millwood, and John D. Sherman, Chappaqua, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 10, 1981, Ser. No. 329,501

Int. Cl.³ C13D *3/12*; C07H *1/06*

U.S. Cl. 127—46.3 **5 Claims**



1. A process for separating lactulose from admixture with lactose by selective adsorption which comprises contacting a mixture comprising said compounds at a temperature of from 30° C. to 100° C. and at a pressure sufficient to maintain the system in the liquid phase with an adsorbent composition comprising at least one crystalline aluminosilicate zeolite selected from a group consisting of modified zeolite Type Y having a cation site concentration of from about 40 to about 10 equivalents per mole unit cell and a face centered cubic unit cell having an a_o for the decationized form of from 24.3 to 24.6 Å in which the zeolitic cations are more than 50% barium or potassium, whereby lactulose is selectively adsorbed thereon; removing the nonadsorbed portion of said mixture from contact with the zeolite adsorbent; and desorbing the lactulose therefrom by contacting said adsorbent with a desorbing agent and removing the desorbed lactulose.

4,394,179

ABRASIVE-CONTAINING CONTACT LENS CLEANING MATERIALS

Edward J. Ellis, Georgetown, and Joseph C. Salamone, Marblehead, both of Mass., assignors to Polymer Technology Corporation, Wilmington, Mass.

Continuation-in-part of Ser. No. 51,960, Jun. 25, 1979, abandoned. This application Oct. 15, 1980, Ser. No. 197,223

Int. Cl.³ B08B *11/00, 7/00*; C11D *3/14, 17/08*

U.S. Cl. 134—7 **3 Claims**

2. A method of cleaning an ophthalmic hard contact lens, said method comprising,

applying an aqueous cleaning solution containing a silica gel abrasive having an average particle size of no more than 10 microns of a particle size sufficient for use in lens polishing present in an amount of from 0.1% by weight to a value below that which would cause damaging scratching or changing of the power of the lens,

a surface active agent in an amount of from 0.1 to 30% by weight and a separate suspending agent to a surface of a lens and abrading said surface to remove unwanted surface deposits if present without changing the power of the lens or adversely affecting or scratching said lens,

said suspending agent being selected from the class consisting of inorganic salts and hydrophilic polymers.

4,394,180

METHOD OF FORMING HIGH RESISTIVITY REGIONS IN GAAS BY DEUTERON IMPLANTATION

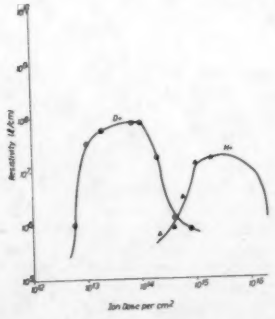
Geoffrey Dearnaley, Abingdon, England; Kenneth Steeples, Edinburgh, Scotland, and Ian J. Saunders, Morecambe, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jun. 12, 1980, Ser. No. 158,871

Claims priority, application United Kingdom, Jun. 12, 1979, 7920389

Int. Cl.³ H01L *21/263*

U.S. Cl. 148—1.5 **9 Claims**

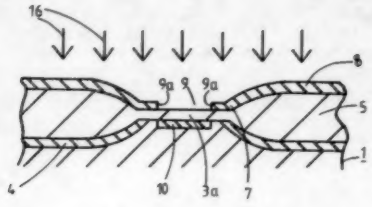


1. A process for producing a semi-conductor device having regions of high resistivity in a semi-conductor substrate body comprising gallium arsenide or other related compounds and mixed crystals which show similar electrical behavior to gallium arsenide, comprising the sole operation of implanting deuterons only into the said regions of the substrate body with energies only up to a maximum value corresponding to a desired depth of penetration into the substrate body.

4,394,181
METHODS OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A CHANNEL REGION SPACED INSIDE CHANNEL STOPPERS

Keith H. Nicholas, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,041
Claims priority, application United Kingdom, Oct. 3, 1980, 8031992
Int. Cl.³ B01J 17/00; H01L 21/263
U.S. Cl. 148—1.5 10 Claims



1. A method of manufacturing a semiconductor device with an insulated gate field effect transistor having a channel region comprising the steps of

providing a first masking layer on a major surface of a semiconductor body of one conductivity type,

introducing a dopant into unmasked areas of said semiconductor body through said first masking layer to form channel stoppers of said one conductivity type, said channel stoppers having a higher concentration of said dopant than adjoining portions of said semiconductor body,

oxidizing said unmasked areas of said semiconductor body to form an oxide layer inset on said semiconductor body, said channel stoppers being present below said inset oxide layer,

removing said first masking layer to expose a first window bounded by said inset oxide layer,

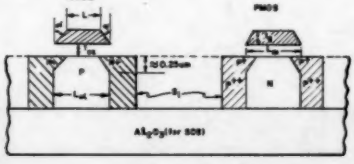
providing a second masking layer on said inset oxide layer and inside said first window for masking against ion implantation, said second masking layer providing a second window having sides parallel to the channel length situated within said first window, said sides determining the width of the channel region to be spaced apart from said channel stoppers, and

implanting ions characteristic of a second conductivity type through said second window to form said channel region.

4,394,182
MICROELECTRONIC SHADOW MASKING PROCESS FOR REDUCING PUNCHTHROUGH

Roy L. Maddox, III, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 14, 1981, Ser. No. 311,206
Int. Cl.³ B01J 17/00; H01L 21/265
U.S. Cl. 148—1.5 26 Claims



1. A process for controlling the impurity profile distribution in a body of semiconductor material which includes a conductive layer, comprising the steps of:

defining a masking member on a laterally extending major surface of said body in a predetermined pattern;

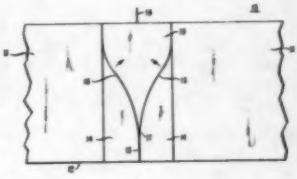
etching said surface and said body through said conductive layer using said masking member as a mask so as to form a truncated, pyramidal shaped gate element having sides which slope to form tapered gate edges; and

ion implanting active regions of said semiconductor circuit using said gate element as a mask so as to form active regions having lighter and shallower degenerately doped portions under said tapered gate edges, a channel region being defined under said gate element between said active regions, the length of said channel region extending between said active regions under said gate element, the length of said channel between said degenerately doped portions being less than the length of said channel region beneath said degenerately doped portions.

4,394,183
SOLIDIFICATION OF MOLTEN MATERIALS

Kenneth A. Jackson, Plainfield, and Lionel C. Kimerling, Westfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 18, 1981, Ser. No. 322,575
Int. Cl.³ H01L 21/24
U.S. Cl. 148—1.5 24 Claims



1. A method comprising

establishing, within an at least two component molten material, an advancing freezing interface which is curved, with at least two tangents from portions of the interface which intersect, the solubility of at least one of the components of the melt being higher in the melt phase than in the solid phase, whereby the at least one component solidifies along the locus of intersecting tangents, with an enriched concentration higher than the average concentration of that component taken over the entire initial molten zone just before the onset of solidification.

4,394,184
DETERMINATION OF GRAIN REFINERS IN PHOSPHATE CONVERSION COATING BATHS

Richard G. Adams, Audubon, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 26, 1982, Ser. No. 362,572
Int. Cl.³ C23F 7/08
U.S. Cl. 148—6.15 R 14 Claims

1. A process for determining the concentration of a phosphorous containing organic grain refiner in an aqueous, acidic conversion coating bath which includes an inorganic divalent metal phosphate comprising, determining the chemical oxygen demand of the bath, precipitating the grain refiner from a portion of the bath by raising the pH to above about 4.0 in the presence of excess metal ion, determining the chemical oxygen demand of the precipitated portion of the bath, and determining the concentration of grain refiner in the bath from the difference between the chemical oxygen demand of the bath and the precipitated portion of the bath.

4,394,185

PROCESSING FOR COPPER BERYLLIUM ALLOYS

Henry T. McClelland, Shoemakersville, and Joseph B. Kuhn, Reading, both of Pa., assignors to Cabot Berylco, Inc., Reading, Pa.

Filed Mar. 30, 1982, Ser. No. 363,682
Int. Cl.³ C22F 1/08
U.S. Cl. 148—11.5 C 7 Claims

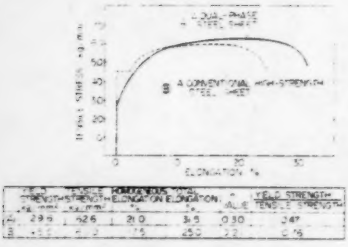
1. In a process for producing formed parts from a copper beryllium alloy, which process includes the steps of: preparing a copper beryllium melt; casting the melt, hot working the cast copper beryllium; solution annealing the copper beryllium; optionally cold working the solution annealed copper beryllium; forming the copper beryllium; and age hardening the formed copper beryllium at a temperature of from 400° to 1200° F. for a period of at least 4 minutes; the improvement comprising the step of preaging the solution annealed or solution annealed and cold worked copper beryllium, prior to forming, at a temperature of from 400° to 1000° F. for a period of up to 180 seconds, the copper beryllium being at final gauge prior to preaging.

4,394,186

METHOD FOR PRODUCING A DUAL-PHASE STEEL SHEET HAVING EXCELLENT FORMABILITY, HIGH ARTIFICIAL-AGING HARDENABILITY AFTER FORMING, HIGH STRENGTH, LOW YIELD RATIO, AND HIGH DUCTILITY

Takashi Furukawa, Machida, and Kazuo Koyama, Kimitsu, both of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 4, 1980, Ser. No. 213,175
Claims priority, application Japan, Dec. 15, 1979, 54-163277
The portion of the term of this patent subsequent to Aug. 25, 1998, has been disclaimed.
Int. Cl.³ C21D 8/02
U.S. Cl. 148—12 F 7 Claims



A	29.9	42.6	21.0	3.5	0.30	247
B						

1. A method for producing a dual-phase steel sheet mainly composed of a ferrite phase and at least one rapidly-cooled transformed phase selected from the group consisting of a martensite phase, a bainite phase and a retained austenite phase, and having a tensile strength not lower than 40 kg/mm², excellent formability and high artificial-aging hardenability after forming, comprising the steps of:

hot rolling a steel containing from 0.01 to 0.12% carbon and from 0.7 to 1.7% manganese, followed by coiling;

continuously annealing the steel sheet, which has undergone the hot rolling, at an annealing temperature in the range of from 730° to 900° C., and;

cooling in two successive stages from the annealing temperature to a temperature lower than 200° C. at an average primary cooling rate (R_1) in the range of 1° C./second $< R_1 <$ 30° C./second over a primary cooling stage from said annealing temperature down to an intermediate temperature (T) in the range of $420 < T < 700$° C., and at an average secondary cooling rate (R_2) in the range of 100° C./second $< R_2 <$ 300° C./second over a secondary cooling stage from the intermediate temperature (T) down to a temperature not higher than 200° C., said secondary average cooling rate (R_2) being high enough within its said range so as to provide the cooled steel sheet with said excellent formability and high artificial-hardenability after forming.

4,394,187

METHOD OF MAKING STEELS WHICH ARE USEFUL IN FABRICATING PRESSURE VESSELS

Hiroo Ohtani, and Seiichi Watsnabe, both of Amagasaki, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Feb. 25, 1981, Ser. No. 238,030
Int. Cl.³ C22C 38/22, 38/32; C21D 8/02
U.S. Cl. 148—12 F 4 Claims

1. A method of manufacturing a steel plate which consists essentially of 0.05 to 0.20% of C, 0 to 0.15% of Si, 0.46 to 1.00% of Mn, 2.00 to 3.50% of Cr, 0.80 to 1.20% of Mo, 0.00015 to 0.0009% of B, 0.005 to 0.070% of Sol. Al, and the balance of Fe, said method including heating a slab for the plate rolling at a temperature of not more than 1150° C.

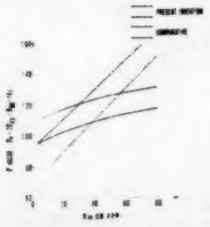
2. A method of manufacturing a steel plate which consists essentially of 0.05 to 0.20% of C, 0 to 0.15% of Si, 0.46 to 1.00% of Mn, 2.00 to 3.50% of Cr, 0.80 to 1.20% of Mo, 0.00015 to 0.0009 of B, 0.005 to 0.070% of Sol. Al, and the balance of Fe, said method including gradually cooling the steel at a rate of not more than 30° C./hour immediately after plate rolling.

4,394,188

PROCESS FOR PRODUCING FERRITE STAINLESS STEEL SHEETS HAVING EXCELLENT WORKABILITY

Jirou Harase, Munakata, and Tadashi Nakayama, Kitakyushu, both of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 6, 1981, Ser. No. 290,713
Claims priority, application Japan, Aug. 9, 1980, 55-108813
Int. Cl.³ C21D 8/04
U.S. Cl. 148—12 EA 3 Claims



1. A process for producing a SUS 430 type ferrite stainless steel sheet having excellent workability, comprising hot rolling a ferrite stainless steel slab containing 0.03 to 0.1% C, 0.08 to 0.5% sol. Al and not less than 70 ppm N with a total reduction of at least 80% in the temperature range from 1150° to 900° C. at the central portion of the slab thickness, reduction by at least one pass of the hot rolling being not less than 35%, coiling at a temperature not lower than 800° C. and, without subjecting the hot rolled steel sheet to annealing, cold rolling the hot rolled steel sheet by a single step into a final thickness.

4,394,189

HIGH PERFORMANCE TUBULARS FOR CRITICAL OIL COUNTRY APPLICATIONS AND IMPROVED PROCESS FOR THEIR PREPARATION

James B. Greer, Houston, Tex., assignor to Lone Star Steel Company, Dallas, Tex.

Continuation-in-part of Ser. No. 261,919, May 8, 1981, Pat. No. 4,354,882. This application Jun. 14, 1982, Ser. No. 387,793
The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.
Int. Cl.³ C21D 9/08
U.S. Cl. 148—12 R 23 Claims

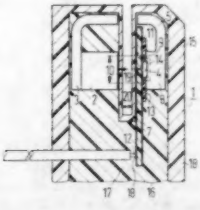
1. A process for manufacturing high performance tubulars having minimum yield strengths ranging from 80,000 to 140,000 psi characterized by improved sulfide stress cracking resistance and improved dimensional control comprising the steps of providing a killed steel bloom comprising in amounts by weight 0.20 to 0.35 percent carbon, 0.35 to 0.90 percent manganese, 0.75 to 1.50 percent chromium, 0.15 to 0.75 percent molybdenum, 0.25 percent maximum nickel, 0.35 percent maximum copper, 0.040 percent maximum phosphorus, 0.04 percent maximum sulfur, 0.35 percent maximum silicon, and the balance iron, except normal steelmaking impurities, upset forging the killed steel bloom in a closed end cylindrical die to form an extrusion billet, hot piercing the extrusion billet while still in the upset forging die, cold machining the outside diameter and the inside diameter to be concentric and cold machining the nose of the extrusion billet, reheating and extruding the extrusion billet to form an extruded shell wherein the cross-sectional area of the extruded shell is in the range of 10 to 40 percent larger than the cross-sectional area of the finished tubular, subjecting the extruded shell to a first intercritical heat treatment to recrystallize and refine the grain structure, removing surface defects by grinding, sizing the ground, heat treated extruded shell by cold working to the finished tubular dimensions, subjecting the sized tubular to a second intercritical heat treatment to recrystallize and refine the grain structure, and subjecting the finished tubular to a quench and temper process wherein the tubular is austenitized, quenched, and tempered to produce a substantially tempered martensitic structure having a minimum yield strength in the range of 80,000 to 140,000 psi.

4,394,190

MAGNETIC GATE AND METHOD OF PRODUCTION THEREOF

Wilhelm Ertl, Ottobrunn; Ulrich Lachmann, and Heinrich Pertsch, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich

Filed Jan. 16, 1981, Ser. No. 225,686
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1980, 3001771
Int. Cl.³ H01L 43/06
U.S. Cl. 148—31.55 4 Claims



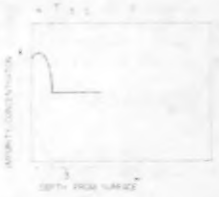
1. Magnetic gate, comprising a magnetically permeable metal piece having first and second parts being spaced apart from each other, a pole shoe being integral with said second part of said metal piece and protruding toward said first part of said metal piece, a thin intermediate carrier being firmly connected to said pole shoe, finger-like contact structures integral with said intermediate carrier, a semiconductor chip having an integrated circuit being soldered to said finger-like contact structures, a synthetic material plate with contact structures being disposed on said intermediate carrier, outer junction wires being connected to outer ends of said contact structures of said synthetic material plate, a magnet being fastened to said first part of said metal piece and protruding toward said second part of said metal piece, said magnet having a magnetic pole with an at least partly flat surface being opposite said pole shoe and semiconductor chip defining an open space therebetween, said first and second parts of said metal piece being separated by the direct interposition of said magnet, open space, semiconductor chip and pole shoe, and synthetic insulation material embedding and fixing said metal piece, magnet and pole shoe in place.

4,394,191

STACKED POLYCRYSTALLINE SILICON FILM OF HIGH AND LOW CONDUCTIVITY LAYERS

Yasuo Wada, Tokyo; Hiroo Usui, Machida; Makoto Ohkura, Hachioji; Masanobu Miyao; Masao Tamura, both of Tokorozawa, and Takashi Tokuyama, Higashikurume, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 17, 1980, Ser. No. 217,224
Claims priority, application Japan, Dec. 17, 1979, 54-162760
Int. Cl.³ H01L 21/263; B05D 3/06
U.S. Cl. 148—33.1 10 Claims



1. A polycrystalline silicon film comprising a second layer and a first layer formed on the second layer, the second layer being formed by impurity doping and thermal annealing prior to forming the first layer, said second layer having an activated impurity concentration that is not higher than a solid solubility, and the first layer being formed on said second layer and having an activated impurity concentration that is higher than the solid solubility, whereby a polycrystalline film having a low resistivity is formed.

4,394,192

METHOD FOR PRODUCING LOW SILICON STEEL ELECTRICAL LAMINATION STRIP

Prabhat K. Rastogi, Munster, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Jul. 2, 1981, Ser. No. 279,830
Int. Cl.³ H01F 1/00
U.S. Cl. 148—120 11 Claims

1. In a method for producing cold rolled steel strip for use in electric motor laminations, the steps of:

providing a steel consisting essentially of the following composition in wt.% before cold rolling:

carbon	.06 max.
manganese	.55-.75
silicon	.15-.25
aluminum	.15-.25
phosphorus	.12 max.
sulfur	.025 max.
iron	essentially the balance;

hot rolling said steel into steel strip;

coiling said hot rolled steel strip while the steel is at a coiling

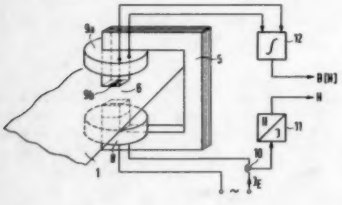
temperature in the range 1250°–1400° F. (682°–760° C.) and then allowing said coiled strip to cool;
cold rolling said steel strip;
continuously annealing said steel strip at a strip temperature in the range 1250°–1400° F. (682°–760° C.) for about 2–5 minutes, and then allowing said strip to cool;
and temper rolling said strip to produce a reduction of about 5–7.5%;
whereby said steel strip, after said temper rolling step, has a grain size and crystallographic orientation which, upon subsequent magnetic annealing at a temperature in the range 1400°–1550° F. (760°–843° C.) for about 1–2 hours in a decarburizing atmosphere, produces an average ferritic grain size of about 3.5–5.0 ASTM and a preponderance of crystallographic planes containing the easiest direction of magnetization.

4,394,193

METHOD AND DEVICE FOR THE CONTINUOUS, CONTACTLESS MONITORING OF THE STRUCTURE STATE OF COLD STRIP

Manfred Gfrerer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 16, 1981, Ser. No. 254,613
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1980, 3015894
Int. Cl.³ C21D 1/54
U.S. Cl. 148—129 **5 Claims**



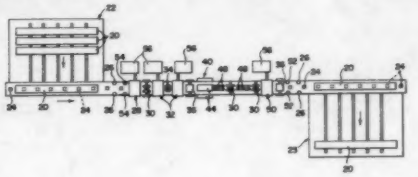
1. A method for continuous monitoring of the internal structure of a metal strip subjected to an annealing treatment, said method comprising the steps of:
inducing a first magnetic flux of cyclically varying intensity in the strip at one point in the annealing treatment;
simultaneously measuring the intensity of the first flux modified by said strip;
forming a first predetermined functional relationship between the measured intensity and the induced intensity to determine energy lost due to variation of the intensity of the first flux;
inducing a second magnetic flux of cyclically varying intensity in said strip at a later point in the annealing treatment;
simultaneously measuring the intensity of the second flux modified by said strip;
forming a second predetermined functional relationship between the measured intensity and the induced intensity of the second flux to determine energy lost due to variation of the intensity of the second flux;
comparing the energy lost due to variation of the first flux to energy lost due to variation of the second flux to obtain a measure of the change of internal structure of the metal strip between the first and second points, and
controlling the annealing process as a measure of said change.

4,394,194

METHOD FOR HEAT TREATING STRUCTURAL MEMBERS

George L. Satava, Arlington, Tex., and Carroll L. Deemer, Euclid, Ohio, assignors to Midland Steel Products, Cleveland, Ohio

Filed Sep. 29, 1980, Ser. No. 192,430
Int. Cl.³ C21D 1/18
U.S. Cl. 148—131 **22 Claims**



1. A method for induction heat treating and quenching of a structural member of carbon steel to a uniform martensitic structure, said structural member having a web and at least one flange substantially perpendicular thereto consisting of
induction preheating the structural member to a temperature in the range of 900° to 1400° F. by means of at least one coil utilizing the frequency in the range of 180 to 3000 cycles;
continuting in a separate induction heating stage to heat the structural member to the austenitizing temperature in the range of 1450° to 1800° F. by the use of at least one coil having a higher frequency than that of the prior step;
liquid quenching the structural member with a multiplicity of nozzles immediately, said nozzles being disposed at an angle in the direction of the advance of the structural member and the pressure regulated from the bottom of the quench zone liquid quench within the range of 10 to 20 pounds per square inch, from the top of the quench zone liquid quench in the range of 1.5 to 6 pounds per square inch and from the sides of the quench zone liquid quench in the range of 5 to 25 pounds per square inch of the structural member to minimize distortion thereof;
concurrently restraining the member by its web in a series of segmented restraining rolls placed on the bottom and the top thereof so as to present slots through which the liquid may be sprayed to quench the structural member until the structural member has reached a temperature below 1000° F. to minimize localized bow distortion;
induction heating the structural member to a temperatering temperature in the range of 750° to 1250° F. by the use of a coil having a frequency in the range of 180 to 3000 cycles; and
subsequently restraining the structural member while cooling to avoid camber distortion by passing the structural member through web restraining and tapered roll flange forming rolls, followed by tapered vertical restraint rolls, and finally flange surface engaging rolls to minimize cambering distortion.

4,394,195

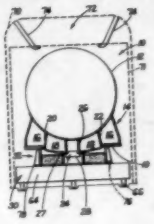
COOLING OF CENTER PLATE TO AVOID SOFTENING

Harold T. Ried, and Edgar C. Weaver, both of St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Jul. 16, 1982, Ser. No. 398,750
Int. Cl.³ C21D 9/00
U.S. Cl. 148—149 **18 Claims**

1. Apparatus for heat treating a railway car body while maintaining a portion thereof unheat treated comprising: a heat treat furnace having means for heating a railway car body; movable support means for moving the railway car body into the heat treating furnace; an insulating box located on said support means; said insulating box including end support

means for supporting a portion of said railway car body and center support means for supporting at least a portion of the railway car body; an opening within said insulating box adapted to receive a portion of said railway car body which is not to be heat treated; insulating means surrounding said center car support means; means for introducing a cooling medium into said center support means whereby said cooling medium maintains said car body depending portion at a sufficiently low temperature to avoid substantial softening of the depending portion and whereby said heat treating furnace heat treats the remaining portion of said car to a desired heat treating temperature.



13. A method of heat treating a railway freight car body while maintaining a selected portion in an unsoftened state comprising: locating an insulating box adapted to receive a depending portion of a railway car which is not to be softened upon a movable support member; providing insulating adjacent said depending portion to prevent heat from a heat treating furnace from softening said depending member; circulating a cooling medium into the area where said depending member is located while heat treating the railway freight car body and removing the railway freight car from the heat treating furnace and disconnecting the flow of said cooling media into said insulating material.

4,394,196

METHOD OF ETCHING, REFILLING AND ETCHING DIELECTRIC GROOVES FOR ISOLATING MICRON SIZE DEVICE REGIONS

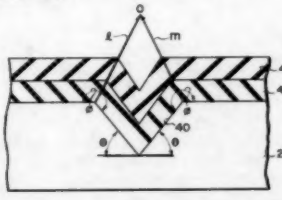
Hiroshi Iwai, Takaidonishi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 13, 1981, Ser. No. 282,642

Claims priority, application Japan, Jul. 16, 1980, 55-97223; Jul. 16, 1980, 55-97224; Nov. 29, 1980, 55-168582

Int. Cl.³ H01L *21/76, 27/00*

U.S. Cl. 148—187 **22 Claims**



1. A method for manufacturing a semiconductor device comprising:

(a) forming at least one groove at a predetermined portion of a semiconductor substrate;

(b) depositing insulating material on the surface of the semiconductor substrate including the groove, said insulating material being deposited until on the non-grooved surface of the substrate a depth greater than one half the opening width of the groove is achieved, thereby filling the groove with insulating material;

(c) doping at least a part of the surface of the insulating material with low melting point material and melting this doping material by heat treatment;

(d) etching the insulating material by the depth thereof on the non-grooved surface of the semiconductor substrate to form a field region consisting of insulating material left in the groove; and

(e) forming an active element in that region of the semiconductor substrate which is isolated, at least in part, by said field region.

4,394,197

COOK-OFF RESISTANT BOOSTER EXPLOSIVE

Irving Kabik, Silver Spring, and Vernon D. Ringbloom, West Friendship, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 19, 1981, Ser. No. 265,133

Int. Cl.³ C06B *45/10*

U.S. Cl. 149—19.3 **4 Claims**

1. An explosive composition having a mild cook-off character comprising:

A. a mixture of explosives comprising

(1) from 58 to 62 weight percent of 1,3,5-triamino-2,4,6-trinitrobenzene, and

(2) the remainder being a second explosive selected from the group consisting of cyclotetramethylenetetranitramine, cyclotrimethylenetrinitramine, and mixtures thereof; and

B. a compatible binder of polytetrafluoroethylene having a glass transiton temperature (Tg) greater than 105° C.

4,394,198

WATER-IN-OIL EMULSION EXPLOSIVE COMPOSITION

Fumio Takeuchi, and Masao Takahashi, both of Aichi, Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo, Japan

Filed Aug. 17, 1981, Ser. No. 293,094

Claims priority, application Japan, Aug. 25, 1980, 55-115819; Sep. 8, 1980, 55-124201

Int. Cl.³ C06B *45/02*

U.S. Cl. 149—21 **6 Claims**

1. A water-in-oil emulsion explosive composition comprising a disperse phase formed of an aqueous oxidizer solution consisting of (a) an inorganic oxidizer salt selected from the group consisting of ammonium nitrate, and a mixture of ammonium nitrate with at least one of sodium nitrate and calcium nitrate, (b) water and (c) at least one member selected from lithium, sodium, potassium, calcium and ammonium salts of weak acid and condensed phosphoric acid; a continuous phase formed of a combustible material consisting of (d) fuel oil and/or wax; (e) an emulsifier; and (f) hollow microspheres or microbubbles.

4,394,199

EXPLOSIVE EMULSION COMPOSITION

Philip Barnhard, IV, Spanish Fork, and Lyman G. Bahr, Payson, both of Utah, assignors to Agnus Chemical Company, Northbrook, Ill.

Filed Sep. 8, 1981, Ser. No. 299,742

Int. Cl.³ C06B *45/02*

U.S. Cl. 149—21 **9 Claims**

1. A water-in-oil emulsion explosive composition consisting essentially of (a) an aqueous phase comprised of a solution of oxidizing salts, (b) an oil phase consisting essentially of a nitroparaffin having three carbon atoms and optionally a hydrocarbon, (c) an emulsifying agent, and (d) at least one sensitizing agent.

4,394,200
PILE EXTILE ARTICLES AND PROCESS AND DEVICE FOR THEIR MANUFACTURE

Pierre Grosjean, Lyons, France, assignor to Rhone-Poulenc-Textile, Paris, France

Continuation of Ser. No. 84,638, Oct. 5, 1979, abandoned. This application Mar. 5, 1981, Ser. No. 240,814
Claims priority, application France, Oct. 13, 1978, 78 29473; Oct. 13, 1978, 78 29475; Japan, Oct. 13, 1978, 53/29474
Int. Cl.³ D04H *11/00*
U.S. Cl. 156—72 **1 Claim**

1. A process for introducing pile textile elements in the form of bundles of a plurality of substantially parallel filamentary textile materials having a base stably joining the materials at one end of the bundle into the meshes of a flexible meshed grid wherein the dimension of the base is slightly greater than the openings of the meshes of said grid, comprising

(1) seating said pile textile element in a truncated cone-shaped inserting tool which is open at its wide end, said cone being defined by a plurality of radially inwardly compressible fingers along the generatrices of the cone,

(2) passing the cone-shaped inserting tool with the pile textile element seated therein through a mesh of the grid from one side to the other side thereof,

(3) removing the cone-shaped tool from the tile textile element while leaving the element locked in said mesh by means of said base,

(4) radially inwardly collapsing said fingers so that the diameter of the wide end of the cone becomes narrower than the opening of the meshes of the meshed grid,

(5) passing the opened end of the collapsed cone through an empty mesh of said grid from said other side to said one side,

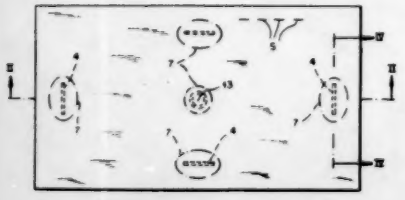
(6) expanding said fingers to their normal opening so that the step (1) may be repeated, and

(7) repeating the steps (1)–(6) at least once.

4,394,201
CONCRETE SLAB ASSEMBLY, ESPECIALLY FOR BUILDING FACADES

Ernst Haeussler, Grashofstr. 47, 4300 Essen 1, Fed. Rep. of Germany

Division of Ser. No. 202,746, Oct. 31, 1980. This application Dec. 28, 1981, Ser. No. 334,595
Int. Cl.³ B32B *31/16*; E04B *2/28*
U.S. Cl. 156—73.6 **4 Claims**



1. A method of making a composite panel comprising the steps of:

casting a first reinforced concrete slab in a horizontal formwork bed with tubular anchors projecting from said first slab;

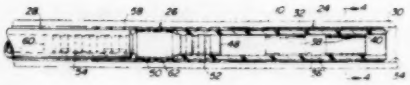
casting a second reinforced concrete slab in a horizontal formwork bed with convoluted wire reinforcing rings having a ring plane lying in the plane of said second slab disposed at locations corresponding to said tubular anchors, the convolutions of said ring lying transverse to said ring plane; and

turning over said first slab upon the setting thereof and lowering it toward said second slab prior to the setting thereof and vibrating said anchors into the concrete of said second slab and into the rings thereof.

4,394,202
METHOD FOR RELINING AN UNDERGROUND GAS LINE OR THE LIKE WITHOUT EXCAVATION

William R. Thomas, Malvern, and George S. Sykora, Strafford-Wayne, both of Pa., assignors to UMAC, Inc., Paoli, Pa. and Brooklyn Union Gas Company, Brooklyn, N.Y., a part interest

Filed Jan. 22, 1981, Ser. No. 227,336
Int. Cl.³ B32B *35/00*
U.S. Cl. 156—94 **22 Claims**



1. A method of repairing or relining a pipeline or the like, comprising the steps of:

obtaining access to an opening into the pipeline;

mounting an expandable sealing unit by means of a connecting means to the end of a predetermined length of flexible tubing;

positioning said expandable sealing unit with said flexible tubing connected thereto at a selected position within said pipeline;

heating said expandable sealing unit by means of a heating unit positioned within said expandable sealing unit;

expanding, in response to said heating, said expandable sealing unit to expand to form a tight seal between the outer surface of said expandable sealing unit and the interior surface of said pipeline; and,

removing said heating unit from the internal portion of said expandable sealing unit whereby said pipeline is provided with a flexible tubing mounted within the pipeline to be repaired and sealably connected to said pipeline.

4,394,203
PROCESS FOR MANUFACTURE OF THREE-DIMENSIONAL ROTATIONAL PARTS AND MACHINE FOR THE IMPLEMENTATION OF SUCH PROCESS

Bruno Bompard, and Alain Bruyere, both of Lyons, France, assignors to Commissariat a l'Energie Atomique and Societe Brochier et Fils, both of Paris, France

Filed Jun. 23, 1981, Ser. No. 276,536
Claims priority, application France, Jul. 1, 1980, 80 14640
The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.
Int. Cl.³ B65H *81/00*
U.S. Cl. 156—175 **14 Claims**

1. A process for the manufacture of rotational parts from a three-dimensional material comprising the steps of producing a supporting mandrel provided with longitudinal and circumferential rows of barbs which between them define longitudinal corridors and circumferential corridors,

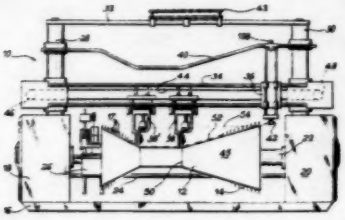
placing superimposed layers of longitudinal threads and of

circumferential threads mounting the longitudinal threads continuously along the contour of the mandrel, in the said corridors, some of the longitudinal threads being placed in only a portion of length of the corresponding longitudinal corridors, and having extremities which do not extend out of the corresponding longitudinal corridors,

maintaining said extremities continuously following their application to said mandrel by winding at least one holding thread in at least one circumferential corridor next to said extremities, simultaneously to the placing of the corresponding layer of longitudinal threads, said extremities of at least some of the longitudinal threads being temporarily maintained by means of a first retractable member before the holding thread is wound on,

densifying the assembly thus obtained, and finally eliminating the supporting mandrel, whereby said rows of barbs and said sheets of threads define the three-dimensional material.

5. A process for the manufacture of rotational parts from a



three-dimensional material comprising the steps of producing a supporting mandrel provided with longitudinal and circumferential rows of barbs which between them define longitudinal corridors and circumferential corridors, placing superimposed layers of longitudinal threads and of circumferential threads in the said corridors, densifying the assembly thus obtained, then eliminating the supporting mandrel, placing some of the longitudinal threads in only a portion of the length of the corresponding longitudinal corridors, extremities of said some longitudinal threads being temporarily held in position by a first retractable member, said some longitudinal threads being then caused to come back into the corresponding longitudinal corridors over said first retractable member, said extremities being then held in position inwards of the first retractable member by a second retractable member, said first retractable member being then withdrawn in a direction that is substantially tangential with respect to the mandrel, and at least one holding wire being wound on in at least one circumferential corridor next to said extremities, thereby continuously holding said extremities in position.

4,394,204

METHOD FOR HEAT SEALING

James L. Hutcheson, Mechanicsville, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 132,494, Mar. 21, 1980, abandoned, and Ser. No. 75,844, Sep. 14, 1979, abandoned, said Ser. No. 132,494, is a division of Ser. No. 75,844,. This application Jul. 18, 1980, Ser. No. 170,052

Int. Cl.[3] **B32B** *31/00, 31/20*

U.S. Cl. 156—275.1 **8 Claims**

1. In a method of forming a heat seal on the open end of a flexible container after filling of said flexible container and cleaning of said open end of said flexible container, said cleaning producing moisture on said open end of said flexible container, said flexible container comprising a pair of generally planar walls which have been heat sealed to one another, comprising positioning said open end of said flexible container between a pair of heated bars and subsequently positioning said open end of said flexible container between a pair of chilled bars the improvement comprising maintaining a sufficient gap between said heated bars such that no pressure is applied to said open end of said flexible container while said open end of said flexible container is positioned between said pair of heated bars, evaporating said moisture from said open end of said flexible container while said open end of said flexible container

is positioned between said pair of heated bars and applying sealing pressure to said open end of said flexible container while cooling said open end of said flexible container while said open end of said flexible container is positioned between said pair of chilled bars to thereby provide a hermetic seal on said open end of said flexible container.

4,394,205

METHOD FOR VULCANIZATION BONDING OF FLUORINE-CONTAINING ELASTOMERS TO VULCANIZED NATURAL AND SYNTHETIC ELASTOMERS

Donald R. Blenner, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Mar. 15, 1982, Ser. No. 358,162

Int. Cl.[3] **C09J** *5/02*

U.S. Cl. 156—307.3 **3 Claims**

1. A method for bonding an unvulcanized fluorinated elastomer to a previously vulcanized non-fluorinated elastomer, wherein saud unvulcanized elastomer is cured in situ against said vulcanized elastomer, said method comprising:

exposing at least one surface of said vulcanized elastomer to a fluorine-containing compound selected from the group consisting of sulfur tetrafluoride, boron trifluoride and phosphorus pentafluoride;

coating at least a portion of said at least one surface which has been exposed to said fluorine-containing compound with (a fluorinated elastomeric) an adhesive for fluorinated elastomers;

applying to the adhesive-coated portion of said at least one surface an unvulcanized fluorinated elastomer composition; and

curing said unvulcanized fluorinated elastomer composition.

4,394,206

APPARATUS AND METHOD FOR APPLYING AN ELONGATED TAB TO A MOVING SUBSTRATE

Victor H. Clausen, and Charles E. Asbury, both of Vancouver, Wash., assignors to H. B. Fuller Company, Saint Paul, Minn.

Filed Dec. 17, 1981, Ser. No. 331,647

Int. Cl.[3] **B32B** *31/10;* **B65D** *65/34*

U.S. Cl. 156—322 **12 Claims**

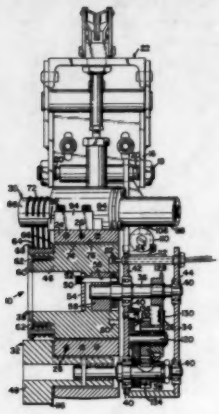
12. A method of extending the period of time during which an elongated flexible member coated with a thermoplastic adhesive is in engagement with a heating roll, comprising the steps of:

(a) providing a second roll having an axis spaced from the axis of the heating roll;

(b) successively coiling the flexible member about both rolls; and

(c) spacing said coils axially along said rolls so that they do not engage one another by pivoting said second roll with

its axis moving in a plane generally parallel to said axis of said heating roll to a position at which said axes are out of parallel alignment so that the angle between said axes in said plane is increased in size.

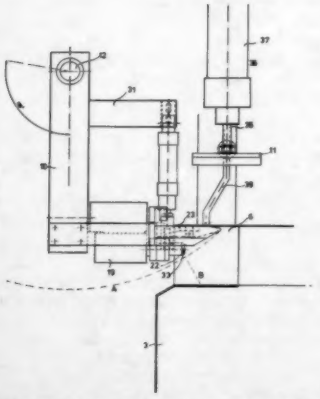


4,394,207

APPARATUS FOR SEALING THE VALVE IN A VALVE BAG

Ernst R. Berthelsen, Terndrup, and Christian Hejlesen, Vadum, both of Denmark, assignors to Bates Ventilsaekke Co. A/S, Norresundby, Denmark

Filed Feb. 26, 1982, Ser. No. 352,767
Claims priority, application Denmark, Mar. 3, 1981, 946/81
Int. Cl.³ B65B 7/02
U.S. Cl. 156—578 10 Claims



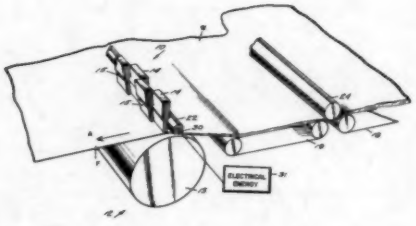
1. An apparatus designed to seal the valve of a valve bag with adhesive, and of the kind where the bags arrive from a bagging machine vertical or somewhat reclining, and which apparatus comprises an adhesive sprayer designed in such fashion that it can be inserted in the bag valve there to apply an apportioned quantity of the adhesive onto the inside of the valve and next be withdrawn, and also comprising a piston member designed so as to apply pressure to the bag valve after the application of adhesive and closing it in the process, characterized in that mounted over and connected to the adhesive sprayer (9) there is an in cross-section bow-shaped shield (23) with rounded front, in such a way that the front ends of shield (23) and adhesive sprayer (9) are flush over and under each other, or that the shield (23) protrudes in relation to the sprayer (9), and where the assembly consisting of adhesive sprayer (9) and shield (23) are suspended or has moving organs in such a way that the assembly during insertion into the bag valve (6) describe a curved motion (A) in the vertical middle of the bag valve, so that when penetrating the bag valve (6) the assembly will lift up the valve, and where the adhesive sprayer (9) is designed to apply adhesive to the lower inside of the bag valve (6).

4,394,208

ULTRASONIC BONDING

Kenneth Y. Wang, Greensboro, N.C., and Berlie R. Hill, Cana, Va., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Aug. 6, 1981, Ser. No. 290,714
Int. Cl.³ B29C 27/08; B32B 31/20
U.S. Cl. 156—580.1 15 Claims



11. Apparatus for vibration welding of material comprising
means for transporting in a first direction a web of material to be vibration welded;
a plurality of ultrasonic vibration sources disposed to act upon substantially the entire width of the web;
anvil means cooperating with said vibration sources to effect welding, said anvil means disposed on the opposite side of the web as said ultrasonic vibration sources;
a roller of hard material extending substantially the entire width of the web; and
means for mounting said roller just before any of said ultrasonic vibration sources so that said roller applies a force to the web.

4,394,209

ARRANGEMENT FOR AFFIXING THE BOTTOM OF A THERMOPLASTIC CONTAINER

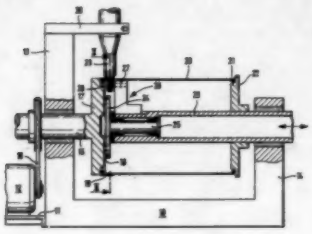
Dieter Kolb, Tuebingen, Fed. Rep. of Germany, assignor to Christian Majer GmbH & Co. KG., Tuebingen, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,883
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 8108746
Int. Cl.³ B29C 27/08; B32B 31/16
U.S. Cl. 156—580.1 7 Claims

1. An improved arrangement for weldingly connecting a cylindrical synthetic thermoplastic container to a bottom also of synthetic thermoplastic material having an annular connecting edge portion integral therewith, the improvement comprising in combination,
a machine frame;
counter pressure means rotatably and axially adjustably mounted in said machine frame;
ultrasonic welding means operatively mounted on said machine frame and adapted to coact with said counter pressure means;

a first disc rotatably mounted in said machine frame coaxially with respect to said counter pressure means;

a drive motor operatively connected to said first disc for drivingly rotating it;



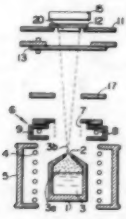
said counter pressure means comprising at least one freely rotatably mounted anvil roller which is adapted to counter-pressure the connecting edge of the bottom or inside the container towards said ultrasonic welding means.

4,394,210

PROCESS FOR FORMING A LEAD FILM

Kiyoshi Morimoto, Mobara, and Toshinori Takagi, Nagaoka-kyo, both of Japan, assignors to Futaba Denshi Kogyo K.K., Chiba, Japan

Filed Mar. 27, 1981, Ser. No. 248,212
Claims priority, application Japan, Mar. 31, 1980, 55-40441
Int. Cl.³ C30B *23/08*
U.S. Cl. 156—608 **5 Claims**



1. A process for forming a lead film including a closed type crucible having at least one injection nozzle, means for heating and vaporizing lead, an ionization chamber, an acceleration electrode having an acceleration voltage, a shutter, a substrate, temperature control means for controlling the temperature of said substrate, and a vacuum chamber surrounding said crucible, said heating and vaporizing means, said ionization chamber, said acceleration electrode, said shutter, said substrate, and said temperature control means, wherein said process comprises:

heating and vaporizing said lead in said crucible to form a pressurized lead vapor;

injecting said lead vapor through said at least one injection nozzle into said vacuum chamber;

maintaining a pressure differential between said vacuum chamber and said lead vapor in said crucible at a ratio of less than or equal to 10^{-2};

using said pressure differential to form a vapor stream of said lead;

generating electron beams within said ionization chamber;

directing said electron beams through said vapor stream so as to form an ionized portion of said vapor stream;

accelerating said ionized portion of said vapor stream toward said substrate with said acceleration electrode;

impinging said vapor stream upon said substrate such that said lead film is deposited thereon;

using said shutter for selectively shielding said substrate from the flow of said vapor stream;

controlling the packing density of said lead film by regulating said acceleration voltage; and

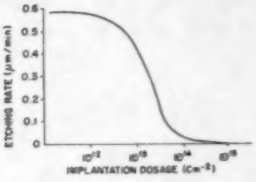
controlling the surface flatness of said lead film by regulating said temperature control means such that the temperature of said substrate is maintained below the melting point of lead.

4,394,211

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A LAYER OF POLYMIDE RESIN

Nobuhiro Uchiyama, Yokohama; Masataka Shingu, Kawasaki, and Saburo Tsukada, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 8, 1982, Ser. No. 415,929
Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*; B29C *17/08*
U.S. Cl. 156—628 **6 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

forming on a substrate a polyimide resin layer,

implanting an ion into a portion of said polyimide resin layer to substantially decrease the etching rate of said portion of said polyimide resin layer, are

carrying out a selective etching of said polyimide resin layer so that the etching is sbustantially blocked by said portion of said polyimide resin layer.

4,394,212

BLEED-FAST CATIONIC DYESTUFFS

Alex Peciluyko, Glen Mills, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Division of Ser. No. 88,288, Oct. 26, 1979, Pat. No. 4,359,419, which is a division of Ser. No. 902,661, May 4, 1978, Pat. No. 4,221,562. This application Nov. 9, 1981, Ser. No. 319,854
The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.
Int. Cl.³ D21H *3/80*
U.S. Cl. 162—162 **2 Claims**

1. A dyed, non-woven, absorbent, cellulosic web having good bleed fastness comprising cellulosic fibers and a water-insensitive cationic dyestuff on said cellulosic fibers, said dyestuff comprising the reaction product of a dialdehyde selected from the group consisting of glyoxal and glutaraldehyde and a cationic, water-soluble dyestuff having a functional group capable of reacting with the dialdehyde to form a water-insensitive reaction product dyestuff wherein the functional group of the water-soluble dyestuff is a lower alkylene amine of the formula—$(CH_2)_nNH_2$ wherein n is from 1 to 5.

4,394,213

HYDROXY-ALUMINUM/LIGNIN SULFONATE COMPOSITIONS

Richard L. Ferm, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 1, 1981, Ser. No. 279,299
Int. Cl.³ D21H *3/18*
U.S. Cl. 162—163 **15 Claims**

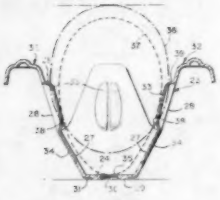
1. A composition comprising about 30% by weight to about 95% by weight water and about 70% by weight to about 5% by weight of a solute, said solute comprising a mixture of a lignin sulfonate salt and a polymeric hydroxy-aluminum salt in a weight ratio of lignin sulfonate to hydroxy-aluminum of from about 1:4 to about 4:1.

4,394,214

CONSTRUCTION OF UNIVERSAL EGG CELL CUSHION AND METHOD

Kenneth D. Bixler, Huntington, N.Y.; Henry A. Lord, Cape Elizabeth, Me., and Richard F. Reifers, New Canaan, Conn., assignors to Diamond International Corporation, New York, N.Y.

Filed Sep. 29, 1981, Ser. No. 306,980
Int. Cl.³ D21J *7/00*
U.S. Cl. 162—228 **5 Claims**



1. The method of forming a vertically elongated hollow thin walled cushion or pillopad on a side wall of an egg cell, including

fastening to the screen side of the egg cell perforated mold an elongated grooved bubble shaped segment, and

sucking, by the application of vacuum, pulp fibres from a pulp slurry on the screen and over the grooved bubble segment to form a relatively thin layer of pulp fibres in relation to the surface of said bubble segment, the vacuum on the side of the screen opposite from the bubble segment side is also present in the groove and serves to insure that fibres form in relation to the surface of said bubble segment.

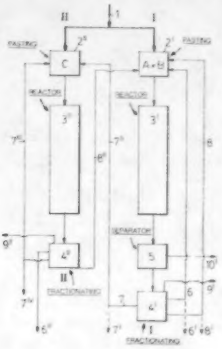
4,394,215

APPARATUS FOR CONVERTING COAL INTO LIQUID PRODUCTS

Berend Jager; Andries Brink, both of Sasolburg, and Cornelis Kleynjan, Lochvaal, all of South Africa, assignors to Sasol One (Proprietary) Limited, Sasolburg, South Africa

Division of Ser. No. 156,684, Jun. 5, 1980, Pat. No. 4,318,797. This application Nov. 23, 1981, Ser. No. 324,264
Claims priority, application South Africa, Jun. 18, 1979, 79/2997
Int. Cl.³ B01D *11/02*; C10C *3/08*; C10G *21/00*
U.S. Cl. 196—14.52 **12 Claims**

1. An apparatus for carrying out a coal liquefaction process comprising in parallel separate and distinct first and second coal digestion reactors for digesting particulate coal in a pasting oil under pressure, first and second separate and distinct coal slurrying means feeding separately into the first and second reactors respectively, fractionating means coupled to said first and second reactors and adapted to produce light oil, middle oil and heavy or residue fractions, means for recycling to the first slurrying means heavy or residue fraction derived at least in part from the discharge of the second reactor, means for recycling to the second slurrying means middle oil derived at least in part from the discharge of the first reactor, and



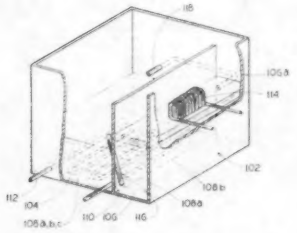
means for discharging as a product light oil derived from the discharge of the second reactor.

4,394,216

VAPOR CONDENSATE RETURN MEANS IN A VAPOR GENERATING AND RECOVERY APPARATUS

James W. McCord, 9101 Nottingham Parkway, Louisville, Ky. 40222

Filed Dec. 24, 1981, Ser. No. 334,169
Int. Cl.³ B01D *3/02*
U.S. Cl. 202—170 **12 Claims**



1. A vapor generating and recovery apparatus comprising:

a housing having a vaporizing chamber and a condensing chamber therein separated by a first weir of preselected height;

means to add heat to said vaporizing chamber and means to remove heat from said condensing chamber; and,

means to transfer condensate from said condensing chamber, to said vaporizing chamber, said means to transfer condensate including means to separate components within the condensate and return said separated components in separate streams to said vaporizing chamber, said means to remove heat being disposed within said condensing chamber below the upper extremity of said weir and spaced sufficiently above said means to transfer condensate for providing a constant vapor blanket over the means to remove heat from the condensing chamber.

9. A vapor generating and recovery apparatus comprising:

a housing having a vaporizing chamber sub-divided into a plurality of sub-chambers by weirs of preselected height, and a condensing chamber separated from said vaporizing chamber by a first weir of a preselected height greater than that of any said weirs sub-dividing said vaporizing chamber;

means to add heat to at least one of said sub-chambers of said vaporizing chamber, and means to remove heat from said condensing chamber;

means to transfer condensate from said condensing chamber to at least one of said vaporizing sub-chambers, said transfer means including means to separate components within the condensate and in returning at least one of said separated components to at least one of said vaporizing sub-chambers, said means to remove heat being disposed within said condensing chamber below the upper extremity of said weir.

4,394,217

APPARATUS FOR SERVICING COKE OVENS

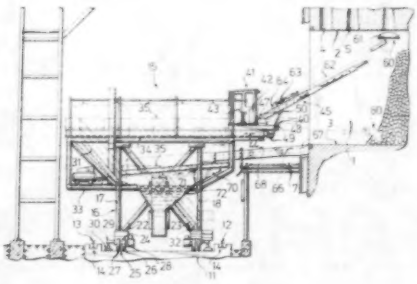
Wilhelm Holz, Gelsenkirchen; Helmut Lukaszewicz, Bottrop, and Karl Gregor, Bochum, all of Fed. Rep. of Germany, assignors to Ruhrkohle Aktiengesellschaft, Essen and Gewerkschaft Schalker Eisenhütte, Gelsenkirchen, both of, Fed. Rep. of Germany

Filed Mar. 27, 1981, Ser. No. 248,452

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1980, 3011781

Int. Cl.[3] C10B *33/06, 39/04, 39/12, 43/06*

U.S. Cl. 202—227 13 Claims



1. Apparatus for servicing coke ovens in a battery, each coke oven having a floor and the battery having a pusher machine side and a coke side, said apparatus comprising:

a gantry having a plurality of vertical supports, each with a controllable and individually driven trackless running gear for moving said gantry along either side of the coke oven battery;

a boom machine mounted on said gantry and movable with respect thereto in a direction transverse to the direction of movement of the gantry along the battery;

a boom having one end mounted on said boom machine for horizontal rotation and vertical pivoting with respect to said boom machine, said boom having a connection head for a work implement at the other end;

a work implement for servicing the coke ovens coupled to said connection head;

an adjustable feed conveyor mounted in said gantry and extendable to the floor of the coke ovens for receiving material discharged from the coke ovens;

coke quenching means mounted in said gantry for receiving material from said feed conveyor;

receiving means mounted in said gantry for receiving material from said coke quenching means; and

a discharge conveyor coupled to said receiving means for discharging the material from said servicing apparatus.

4,394,218

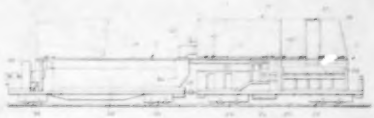
COKE QUENCH CAR EMISSION CONTROL SYSTEM

Joerg P. Baum, Hosel, Fed. Rep. of Germany, assignor to Baumco Gesellshaft fur Anlagentechnick mbH, Essen, Fed. Rep. of Germany

Filed Jan. 11, 1982, Ser. No. 338,275

Int. Cl.[3] C10B *33/00, 33/14, 45/00*

U.S. Cl. 202—263 12 Claims



1. A system for capturing emissions from coke as it is pushed from an oven including:

a first transporter movable in a path adjacent said oven,

coke receiving means and gas cleaning means mounted adjacent each other on said first transporter,

guide means mounted on said first transporter and extending over said coke receiving means and said gas cleaning means,

a second transporter mounted on said guide means and movable thereon from a first position above said coke receiving means to a second position above said gas cleaning means,

said second transporter having hood means mounted thereon, said coke receiving means being open at its upper end for receiving coke, said hood means being open at its lower end and sized to cover the opening in said coke receiving means,

said hood means also having a port for receiving coke from a coke oven,

and coupling means for coupling said hood means to said gas cleaning means

when said second transporter is positioned above said coke receiving means whereby emissions collected by said hood means are transmitted to said gas cleaning means,

the opening in said coke receiving means being exposed when said second transporter is in its second position to permit the coke and in said coke receiving means to be quenched.

4,394,219

FRACTIONATING LIQUIDS

Thomas W. Mix, Wellesley, and Jay S. Dweck, Framingham, both of Mass., assignors to Merix Corporation, Wellesley, Mass.

Continuation-in-part of Ser. No. 161,880, Jun. 23, 1980, abandoned, which is a continuation of Ser. No. 45,839, Jun. 5, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 287,035

Int. Cl.[3] B01D *3/42*

U.S. Cl. 203—1 8 Claims

1. A method of fractionating feed liquid containing fractions having different volatilities, said method being carried out in fractionating tower apparatus including a plurality of multi-stage segments, heaters, and vaporizers, said method comprising

heating said feed liquid, by means of said heaters and vaporizers, to different temperatures to flash vapor fractions of different volatilities,

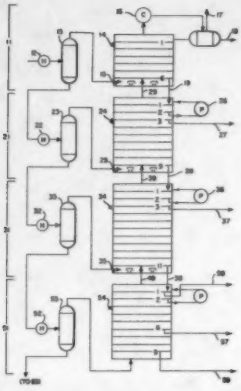
feeding said flashed vapor fractions to different multi-stage segments of said fractionating tower apparatus, fractions of higher volatilities being fed to higher segments,

withdrawing liquid sidestreams from a plurality of said segments,

separately feeding reflex liquid from at least one segment to a segment below it, and

controlling the level of heavy components in at least one

selected liquid sidestream withdrawn from a segment below a segment where vapor is flashed by limiting the temperature at which said vapor is flashed to below the



temperature of the vapor in the tower whose composition most closely matches the composition of the flashed vapor.

4,394,220

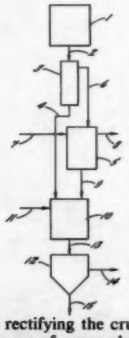
PROCESS FOR RECTIFICATION OF PROPANE NITRATION STREAM

Richard S. Egly, West Terre Haute, and Cecil E. Turnquist, Terre Haute, both of Ind., assignors to Angus Chemical Company, Northbrook, Ill.

Continuation of Ser. No. 182,921, Sep. 2, 1980, abandoned. This application Oct. 22, 1981, Ser. No. 313,862

Int. Cl.³ B01D *3/34, 15/00*

U.S. Cl. 203—42 **3 Claims**



1. In a method for rectifying the crude production stream obtained from the process of vapor phase nitration of hydrocarbon to produce nitroalkanes, which includes passing the vapor phase nitration stream from a nitration chamber through a condenser to condense a substantial portion of the normally-liquid components and separate said normally-liquid components from normally-gaseous components, forming absorber bottoms by passing the gaseous components into a water absorber to wash the gas, said absorber bottoms including nitroalkanes, acetaldehyde, nitrogen, nitrogen oxides and oxygenated compounds, stripping the condenser liquid and absorber bottoms by distillation to form a condensate including a water layer and an oil layer, said oil layer comprising crude nitroalkanes and low boiling components, stripping the low boiling components from the condensate in a heads column, and fractionating the oil layer to produce fractions of nitroalkane components, the improvement comprising, subjecting the condenser liquid and absorber bottoms solely to extractive distillation with substantially pure water to remove sufficient impurities therefrom so that the condensate is relatively free of impurities, thereby avoiding carbonaceous build-up in the heads column and fractionater during extraction of the nitroalkanes.

4,394,221

METHOD OF DEODORIZING AND/OR DEACIDIFYING HIGH-BOILING ORGANIC COMPOUNDS, PARTICULARLY EDIBLE OILS

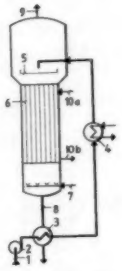
Hermann Stage; Hartmut Hammer, both of Koln-Niehl, and Walter Kühns, Dormagen, all of Fed. Rep. of Germany, assignors to Firma Wilhelm Schmidding GmbH & Co., Cologne, Fed. Rep. of Germany

Filed Apr. 4, 1980, Ser. No. 137,535

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914101

Int. Cl.³ B01D *1/06, 1/14;* **C11B** *3/14*

U.S. Cl. 203—89 **8 Claims**



1. A method of removing volatile impurities from a high-boiling, heat-sensitive organic liquid, which method comprises

(a) passing said high-boiling, heat-sensitive organic liquid which contains volatile impurities downwardly through a multiplicity of parallel, vertically-oriented tubular flow channels so as to divide said organic liquid into a multiplicity of free falling films, said flow channels having inside diameters of 34 to 72 mm and lengths of 6 to 16 meters, the liquid load application being controlled to a rate of between 1 and 2.5 m^3/m.hour/meter of flow channel circumference,

(b) concurrently passing a heated medium along a major portion of the length of said vertically-oriented tubular flow channels, and

(c) concurrently passing a carrier vapor consisting of steam upwardly through said vertically oriented flow channels in counterflow to the flow of said liquid films, the steam exiting the upper ends of said flow channels with the volatile impurities and the organic liquids exiting the lower ends of said flow channels in purified form,

the initial temperatures of said organic liquid in step (a) and said heated medium in step (b) and the flow rate of steam of step (c) being controlled such that the working pressure in said flow channels is between 2 and 10 mbar and the pressure drop thereacross is less than half of the head pressure, the working temperature in the flow channels is below the decomposition point of the organic liquid, the viscosity of the free falling liquid films is less than 0.003 Pa·s, the Reynolds number of the liquid is over 100, the warm-up of the liquid in the flow channels is between 10° and 20° K., the exchange time in the flow channels is between 10 and 20 seconds and the initial temperature of the heated medium is a maximum of 5° K. above the exiting temperature of the purified organic liquid.

4,394,222

METHOD FOR DETERMINING THE OXYGEN CONTENT IN GASES, UNINFLUENCED BY TEMPERATURE VARIATIONS

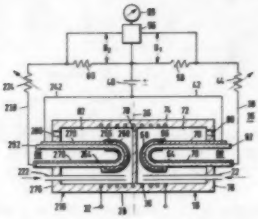
Franz-Josef Rohr, Abtsteinach, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Nov. 19, 1980, Ser. No. 208,432

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1979, 2946775

Int. Cl.³ G01N 27/46

U.S. Cl. 204—1 T 4 Claims



1. Method for determining the oxygen content in gases influenced by temperature variations of the gases which comprises passing said gases in contact with a first electrochemical measuring cell connected to a voltage source, said electrochemical cell having a solid electrolyte which is heated to an operating temperature, and through which a diffusion-limited electric current flows which depends on the oxygen content of the gases and the magnitude of which is determined as a first electrical signal measuring the oxygen content of the gases, the combination therewith of deriving a second electrical signal from the oxygen content of an auxiliary gas with a constant oxygen content by passing the auxiliary gas in contact with a second electrochemical measuring cell which is approximately identical to the first measuring cell with respect to design, operation and operating conditions to obtain said second electrical signal, and forming a temperature-independent quotient from the two electrical signals and employing the quotient as a measure of the oxygen content of the gases, wherein a heater is disposed in the first measuring cell to heat the electrolyte which is an oxygen ion-containing solid electrolyte, a first electrode adjacent an inside surface of the electrolyte and a second electrode adjacent the opposite outside surface, said electrodes connected to the voltage source to form an electric circuit, with one of said electrodes acted on by said gases causing an electric current which flows as a function of the oxygen content of said gases, wherein the second measuring cell also has a solid electrolyte with electrodes on the inside and outside surfaces of the electrolyte, wherein the solid electrolytes of the first and the second measuring cells consist of one piece, wherein the outer electrode for the first cell and for the second cell each is surrounded by an interspace with openings for the introduction and discharge for the feed gases and the auxiliary gas, wherein the interspace of the first cell is connected to said gases and the interspace of the second cell is connected to the auxiliary gas with a double-throw switching device to enable switching the flow of gases from the first interspace to the second interspace and the flow of auxiliary gas from the second interspace to the first interspace and the reverse, wherein the electrodes of the second cell are connected to the voltage source to form a second electric circuit, with said auxiliary gas acting on one of said electrodes causing an electric current to flow in the second circuit as a function of the oxygen content of the auxiliary gas, wherein the two electric circuits are connected to a divider for forming the quotient of said two determined electric current signals, and wherein the temperature-independent quotient is fed to a receiving device acting as an indicating, regulating or controlling device.

4,394,223

TIN AND GOLD PLATING PROCESS

R. Dean Hall, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 6, 1981, Ser. No. 308,973

Int. Cl.³ C25D 5/02, 5/56

U.S. Cl. 204—15 5 Claims

1. A method for plating two metals onto a copper clad substrate comprising the steps of:

a. defining, by utilizing photoresist material, a circuit pattern on the copper cladding which results in protected copper and unprotected copper;

b. etching away the unprotected copper until only a thin layer of copper remains;

c. applying resistive material on selected areas of the thin layer of copper in such a manner that first portions of the circuitry to be plated with a first metal are connected to one another via the resistive material while other portions of the circuitry not to be plated with said first metal are not connected via the resistive material to said first portion;

d. etching away to completion the unprotected copper and then removing all photoresist and resistive material;

e. applying resistive material to said selected areas of copper in order to protect them from plating;

f. electroplating said first portions of the circuitry with said first metal;

g. electroless plating said other portions of the circuit with a second metal by immersing the entire substrate in a plating bath; and

h. removing all resistive material and then etching away the remainder of the thin copper layer.

4,394,224

TREATMENT OF TITANIUM PRIOR TO BONDING

Alauddin Mahoon, and Richard P. J. Kohler, both of Weybridge, England, assignors to British Aerospace Public Limited Company, London, England

Filed Apr. 21, 1981, Ser. No. 256,251

Claims priority, application United Kingdom, Apr. 24, 1980, 8013459

Int. Cl.³ C25D 11/34

U.S. Cl. 204—57 6 Claims

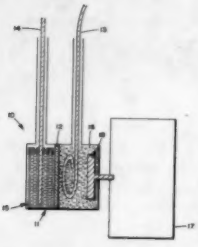
1. A method of treating articles of Titanium or Titanium alloy to form an adhesive receptive oxide layer upon a surface region thereof, which method includes applying to the surface to be treated a mixture of aqueous solutions of sodium hydroxide in a solution concentration of from 0.5 to 5 molar and Hydrogen Peroxide in a solution concentration of from 0.1 to 1 molar, maintaining the applied mixture within a temperature range within which the Hydrogen Peroxide is relatively stable, and impressing a voltage of from 3 to 15 V on the mixture to provide an anodic treatment thereby producing an environmentally stable adhesive bonding surface.

4,394,225

PROCESS FOR THE ADDITION OF IODOPERFLUOROALKANES ONTO ETHYLENIC OR ACETYLENIC COMPOUNDS BY ELECTROCATALYSIS

Auguste Commeyras, Clapiers, and Patrick Calas, Montpellier, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Jun. 29, 1981, Ser. No. 278,609
Claims priority, application France, Jul. 8, 1980, 80 15121
Int. Cl.[3] C25B *3/10*
U.S. Cl. 204—59 R 6 Claims



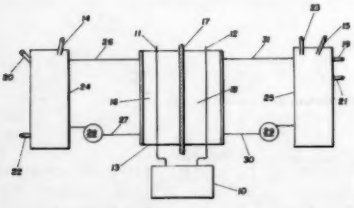
1. A process for the addition of an iodoperfluoroalkane of the formula $CF_3(CF_2)_nI$, in which n is an integer from 1 to 19, onto an ethylenic or acetylenic alcohol or ether having the unsaturation between the second and third carbon atoms, comprising forming a mixture of said alkane and said alcohol or ether and subjecting said mixture to electrocatalysis in an electrolytic cell.

4,394,226

ELECTROLYTIC METHOD FOR PRODUCING QUATERNARY AMMONIUM HYDROXIDES

Robert C. Wade, Ipswich, and Lawrence J. Guilbault, Topsfield, both of Mass., assignors to Thiokol Corporation, Chicago, Ill.

Filed Jul. 28, 1981, Ser. No. 287,594
Int. Cl.[3] C25B *1/00, 3/00*
U.S. Cl. 204—72 13 Claims



1. A process for producing quaternary ammonium hydroxide in an electrolytic cell having an anode compartment containing an anode and a cathode compartment containing a cathode, said anode and cathode compartments being separated by a cationic membrane that has been treated with a mineral acid prior to use in the process and is capable of rejection of passage of essentially all halide anions from said anode compartment to the cathode compartment and capable of permitting a passage of hydrated quaternary ammonium cations from the anode to cathode compartment, comprising: feeding a solution of a quaternary ammonium halide into said anode compartment; feeding water into said cathode compartment; establishing and maintaining a sufficient electrical potential between said anode and cathode to produce a flow of electrical current across said cell thereby causing halide ions to lose an electron at said anode, and combine to form halogen molecules, hydrated quaternary ammonium ions to migrate through said membrane from said anode compartment into said cathode compartment and to combine with hydroxide ions to form quaternary ammonium hydroxide that is essentially free of halide, and to dissociate water at the cathode to form hydrogen and hydroxide ions; and removing a product containing greater than 25 wt. % of quaternary ammonium hydroxide from said cathode compartment.

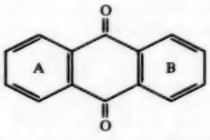
4,394,227

ELECTROCHEMICAL PROCESS FOR THE PREPARATION OF BENZANTHRONES AND PLANAR, POLYCYCLIC AROMATIC OXYGEN-CONTAINING COMPOUNDS

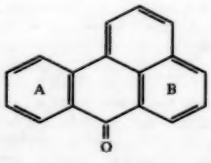
Horst Jäger, Bettingen; Eric Plattner, Seltisberg; Jacques Bersier, Riehen, and Christos Comninellis, Prilly, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Mar. 2, 1982, Ser. No. 354,109
Claims priority, application Switzerland, Mar. 5, 1981, 1475/81; May 8, 1981, 2996/81
Int. Cl.[3] C25B *3/04*
U.S. Cl. 204—73 R 22 Claims

1. An electrochemical process for the preparation of benzanthrone and planar, polycyclic aromatic oxygen-containing compounds, which comprises carrying out the reaction in an electrolytic cell which is separated by a diaphragm into a cathode compartment and an anode compartment and which contains an acid in the cathode compartment, in which process an anthraquinone of the formula



is converted electrochemically in the cathode compartment into the semiquinone form and the latter being reacted with glycerol to give the benzanthrone of the formula

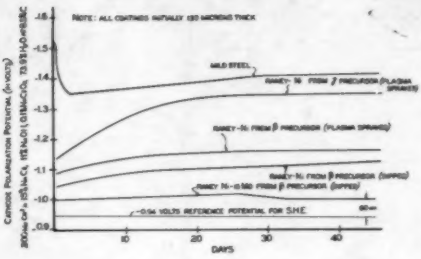


in which the benzene rings A and B can be substituted, and, in the anode compartment, the cations of a transition metal salt are simultaneously converted from a lower oxidation stage into a higher oxidation stage, the cations in their higher oxidation stage being used for the chemical oxidation of planar, polycyclic aromatic compounds to give the corresponding oxygen-containing compounds, said chemical oxidation either carried out directly in the anode compartment or subsequently in a separate reactor vessel; and isolating from the catholyte and anolyte the respective products formed.

4,394,228
RANEY ALLOY COATED CATHODE FOR CHLOR-ALKALI CELLS

Thomas J. Gray, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 179,150, Aug. 18, 1980, Pat. No. 4,370,301. This application Dec. 23, 1981, Ser. No. 334,058
Int. Cl.³ C25B 1/34, 11/04
U.S. Cl. 204—98 **16 Claims**


NOTE: ALL COATINGS NATURALLY 120 MICRONS THICK
MILD STEEL
RANEY-Ni FROM β PRECURSOR (PLASMA SPRAYED)
RANEY-Ni FROM β PRECURSOR (SPRAYED)
RANEY Ni-MO FROM β PRECURSOR (SPRAYED)
-0.94 VOLTS REFERENCE POTENTIAL FOR S.H.E.
DAYS

1. In a process of producing alkali metal hydroxide comprising electrolyzing an aqueous alkali metal chloride brine in an electrolytic cell having an anode, a cathode comprising a substrate with a catalytic surface thereon, said anode being separated from cathode by a synthetic fluorocarbon resin permionic membrane, the improvement wherein

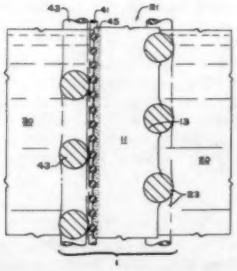
a. said membrane is a member of a class consisting of cationic exchange membranes of hydrophillic phosphonated, sulfonated or carboxylated fluorocarbontelomers; and

b. said cathode surface comprises a Raney nickel alloy, said Raney alloy being predominantly derived from an adherent layer of $Ni_xMo_{1-x}Al_3$ beta structured precursory crystalline surface layer where x is between 0.80 and 0.95.

4,394,229
CATHODE ELEMENT FOR SOLID POLYMER ELECTROLYTE

Malcolm Korach, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 155,277, Jun. 2, 1980, Pat. No. 4,345,986. This application May 3, 1982, Ser. No. 373,951
Int. Cl.³ C25B 1/34, 9/00
U.S. Cl. 204—98 **1 Claim**

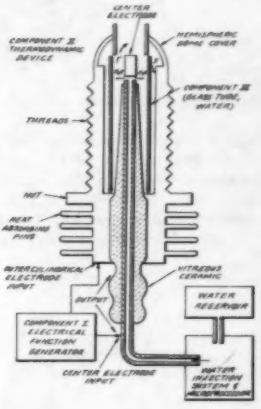


1. In a method of electrolyzing an aqueous alkali metal chloride brine, comprising feeding the brine to the anolyte compartment of a solid polymer electrolyte electrolytic cell having an electrolyte impermeable permionic membrane with an anodic portion and a cathodic portion, anodic means in contact with the anodic portion, and cathodic means in contact with and removably and compressively bearing upon the cathodic portion, the improvement wherein the cathode means removably bearing upon the permionic membrane comprise a microporous ductile member consisting essentially of sintered metallic materials, having a thickness of from about 0.1 millimeter to 1 millimeter, and conforming to the permionic membrane.

4,394,230
METHOD AND APPARATUS FOR SPLITTING WATER MOLECULES

Henry K. Puharich, Rte. 1, Box 97, Delaplane, Va. 22025

Filed Jun. 10, 1981, Ser. No. 272,277
Int. Cl.³ C25B 1/04, 1/10, 9/04
U.S. Cl. 204—129 **9 Claims**



1. A method for splitting water molecules into hydrogen and oxygen comprising

(a) generating complex electrical wave forms matching the complex wave form resonant frequencies of tetrahedral water molecules;

(b) applying said generated wave forms in resonance to said water molecules to shatter said molecules, thereby liberating hydrogen and oxygen.

4,394,231
CATHODE FOR THE ELECTROLYTIC PRODUCTION OF HYDROGEN

Edgard Nicolas, Meise-Eversem, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Continuation of Ser. No. 163,086, Jun. 26, 1980. This application Aug. 28, 1981, Ser. No. 297,311
Claims priority, application France, Jun. 29, 1979, 79 17441
Int. Cl.³ C25B 1/02, 11/06
U.S. Cl. 204—129 **10 Claims**

1. In a process for the production of hydrogen in an electrolytic cell, wherein hydrogen is electrolytically produced on the active zone of a cathode, the improvement consisting in that the cathode active zone essentially consists of a metal oxide produced by the thermal decomposition of a thermally decomposable compound of a metal selected from the group consisting of cobalt, iron, maganese and nickel, said metal oxide being produced in situ on a support made of an electrically conducting material selected from the group consisting of cobalt, chromium, iron, maganese, nickel and alloys of these metals.

4,394,232
PICKLING OF ALUMINUM

Robertus Exalto, Amsterdam, and Adriaan Kwakernaak, Aalsmeer, both of Netherlands, assignors to Fokker B.V., Schiphol-Oost, Netherlands

Filed Feb. 11, 1982, Ser. No. 347,973
Claims priority, application Netherlands, Feb. 12, 1981, 8100686
Int. Cl.³ C25F 1/04
U.S. Cl. 204—144 7 Claims

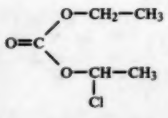
1. A pickling process for aluminum articles, comprising the steps of:
(a) providing a pickling bath consisting essentially of a suspension of carbon particles in sulfuric acid,
(b) immersing an aluminum article to be pickled into said bath, and
(c) maintaining said article in said bath for a period of time sufficient to effect complete pickling of said article.

4,394,233
PROCESS FOR PREPARING ETHYL α-CHLOROETHYL CARBONATE

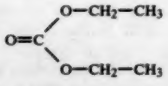
Sang-Woo Park, Seoul, Rep. of Korea, assignor to The Korea Advanced Institute of Science and Technology, Seoul, Rep. of Korea

Filed Jul. 28, 1981, Ser. No. 287,641
Claims priority, application Rep. of Korea, Dec. 23, 1980, 4891/80
Int. Cl.³ B01J 19/12
U.S. Cl. 204—158 HA 5 Claims

1. A process for preparing ethyl α-chloroethyl carbonate having the formula:



which comprises chlorinating diethylcarbonate having the formula:

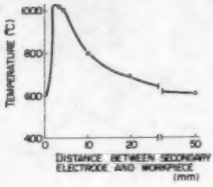


with chlorine gas in the presence of ultraviolet radiation.

4,394,234
METHOD OF PROCESSING ELECTRICALLY CONDUCTIVE MATERIAL BY GLOW DISCHARGE

Naotatsu Asahi, Katsuta; Sizuka Yamaguchi, Hitachi, and Katsuyoshi Terakado, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 4, 1980, Ser. No. 174,748
Claims priority, application Japan, Feb. 2, 1979, 54-10472; Sep. 14, 1979, 54-117298; Jan. 23, 1980, 55-5790
Int. Cl.³ C01B 21/30; C21D 1/48
U.S. Cl. 204—164 20 Claims



1. A surface treatment process wherein glow discharge is established between a cathode and an anode of a power source to carry out heat treatment of a workpiece under a reduced pressure condition in a container, comprising the steps of placing the workpiece which has a conductive surface and which is electrically connected to the cathode in said container, positioning a secondary electrode which has a conductive surface and which is electrically connected to the cathode close to a selected treatment portion of said workpiece, and effecting a glow discharge between the conductive surfaces of said workpiece and the secondary electrode and said anode; the distance between the workpiece and the secondary electrode being set to be 2 to 25 mm to increase the surface temperature of the selected treatment portion of said workpiece and to increase the heat treatment effect on said selected treatment portion of said workpiece and the pressure of the treatment atmosphere being varied in the range 0.1 to 10 Torr to control the treatment temperature.

4,394,235
HEAT-SEALABLE POLYPROPYLENE BLENDS AND METHODS FOR THEIR PREPARATION

John G. Brandt, Clemmons; Joyce H. Dickerson, and William R. Schmitt, both of Winston-Salem, all of N.C., assignors to RJ Archer Inc., Winston-Salem, N.C.

Filed Jul. 14, 1980, Ser. No. 168,905
Int. Cl.³ C08L 23/12; B29D 7/24; C08J 7/18; C08F 212/08
U.S. Cl. 204—165 31 Claims

1. A heat-sealable film consisting essentially of a corona discharge treated, biaxially oriented film comprising a blend of stereoregular polypropylene containing about 5% to about 25% by weight based on the total composition of a terpene-styrene or substituted styrene copolymer consisting of about 85% to about 25% terpene and about 15% to about 75% styrenic monomer.

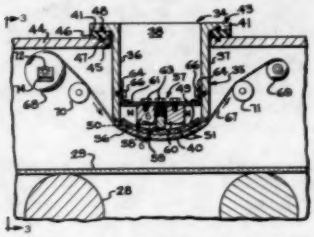
4,394,236
MAGNETRON CATHODE SPUTTERING APPARATUS

Merrill G. Robinson, Ann Arbor, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Feb. 16, 1982, Ser. No. 348,804
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 R 8 Claims

8. A method of sputtering thin films of a selected coating material upon substantially planar substrates in which there is provided a fixed elongated cathode member having a convex surface, establishing in back of said surface a magnetic field providing an erosion pattern on a target consisting of a contin-

uous foil of the material to be sputtered, drawing said continuous foil across and in contact with said convex surface, and



passing beneath said foil target the substrates to receive the coating material sputtered from said foil.

4,394,237

SPECTROSCOPIC MONITORING OF GAS-SOLID PROCESSES

Vincent M. Donnelly, Berkeley Heights; Daniel L. Flamm, Chatham Township, Morris County, and Robert F. Karlicek, Jr., Kenilworth, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 17, 1981, Ser. No. 284,468

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 E **14 Claims**

1. A process for fabricating devices comprising the steps of introducing a gas into proximity to a material surface, inducing a change in said material surface, spectroscopically monitoring said gas and controlling said process in accordance with said spectroscopic monitoring characterized in that the quantitative concentration of a plurality of species in said gas is monitored by inducing fluorescence from said plurality of species with a light source external to said gas wherein at least one of said species fluoresces through a spectroscopic fragmentation process or multiple photon process, and wherein based on the quantitative measurement of said fluorescence the conditions of said fabrication process are adjusted to yield a desired result.

4,394,238

METHOD OF MAKING A MEASURING ELECTRODE ASSEMBLY AND ELECTRODE MADE THEREBY

Jerzy Golimowski, Warsaw, Poland; Laszlo Sipos, V. Gorica, Yugoslavia, and Paul Valenta, Aachen, Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich GmbH, Julich, Fed. Rep. of Germany

Division of Ser. No. 136,932, Apr. 3, 1980, Pat. No. 4,302,314. This application Mar. 25, 1981, Ser. No. 247,325

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914193

Int. Cl.³ G01N *27/30*; H01R *43/00*

U.S. Cl. 204—400 **6 Claims**

1. A method of making a measuring electrode assembly which comprises the steps:

of bonding a disk of electrode material to one end of an elongated conductive element with an electrically conductive adhesive;

immersing said element and said disk bonded thereto into a hardenable synthetic resin to harden into a clump thereabout; and

machining said clump to turn the same into a cylindrical sheath surrounding said element and said disk and exposing a face of said disk by machining said clump flush with said face.

4,394,239

ELECTRO-CHEMICAL SENSOR FOR THE DETECTION OF REDUCING GASES, IN PARTICULAR CARBON MONOXIDE, HYDRAZINE AND HYDROGEN IN AIR

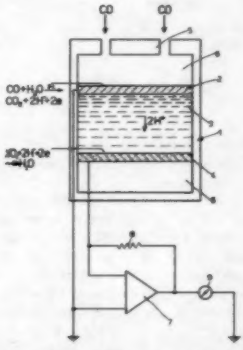
Dieter Kitzelmann, Bonn, and Jacques Deprez, Frechen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 24, 1981, Ser. No. 295,277

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1980, 3033796

Int. Cl.³ G01N *27/54*

U.S. Cl. 204—414 **4 Claims**



1. In an electro-chemical sensor for the measurement of carbon monoxide, hydrogen or hydrazine in ambient air, comprising a catalyst containing measuring electrode exposed to ambient air and communicating through an aqueous acid electrolyte with a non-polarizable counter electrode, the improvement comprising:

(a) a body of an aqueous hygroscopic polymer gel in which ionogenic substances are dissolved, the gel body having sticky surfaces,

(b) the measuring electrode comprising a porous sheet-like matrix, coated with catalyst particles,

(c) the matrix being firmly anchored at the surface of the polymer gel in a self-supporting manner and the catalyst particles being embedded with part of their surfaces in the gel and with the remaining surface portions protruding from the gel.

4,394,240

COMBINED SULFUR OXIDE/OXYGEN MEASURING APPARATUS

Alfred R. Pebler, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 16, 1982, Ser. No. 358,769

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—412 **4 Claims**

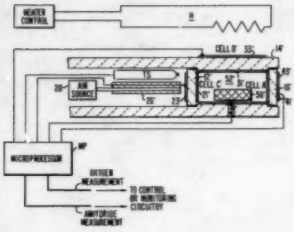
1. A multi-sensor gas measuring apparatus for generating signals indicative of the partial pressure of oxygen and the partial pressure of a selected anhydride, i.e., SO_X, NO_X, etc. of a monitored gas environment comprising,

first and second solid electrolyte electrochemical cells each cell including an oxygen ion conductive solid electrolyte element having a sensing electrode and a reference electrode disposed on opposite surfaces thereof,

a third solid electrolyte electrochemical cell including a solid electrolyte element containing oxy-anions of the selected anhydride having a sensing electrode and a reference electrode disposed on opposite surfaces thereof, said first, second and third solid electrolyte electrochemical cells being combined to form an enclosure having a cavity therein,

a reference composition of said selected anhydride and oxygen being located within said cavity, said reference electrodes of said first, second and third solid electrolyte electrochemical cells being exposed to said reference composition,

said sensing electrode of said first solid electrolyte electrochemical cell being exposed to a gas environment of



known oxygen partial pressure, said first cell generating a signal indicative of the oxygen partial pressure of the reference composition,

said sensing electrodes of said second and third cells being exposed to said monitored gas environment, said second cell generating a signal indicative of the difference in oxygen partial pressure between the monitored gas environment and the reference composition, said third cell generating a signal indicative of the difference between the partial pressure of the combination of oxygen and the selected anhydride in the monitored gas environment and the partial pressure of the combination of oxygen and the selected anhydride in the reference composition, and

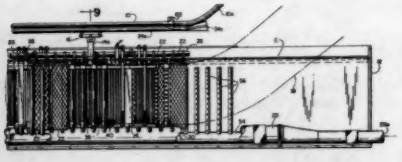
circuit means connected to said first, second and third cells and responding to the signals generated by providing an indication of both the partial pressure of oxygen and the partial pressure of the selected anhydride within said monitored gas environment.

4,394,241

HIGH SPEED PLATING OF FLAT PLANAR WORKPIECES

George R. Scanlon, Pine Meadow, Conn., assignor to Napco, Inc., Terryville, Conn.

Filed Jun. 25, 1981, Ser. No. 277,191
Int. Cl.[3] C25D *17/06, 17/28*
U.S. Cl. 204—198 26 Claims



1. Apparatus for electroplating generally flat planar workpieces which may have small openings onto one or both workpiece surfaces, said apparatus comprising:

(a) racks supporting each workpiece in a generally vertical plane,

(b) transport means for moving each rack along a path, a portion of which path is in the plane of the workpiece so supported in its rack,

(c) means defining a receptacle adapted to contain an electrolytic solution through which solution said racks move along said portion of said path,

(d) pressure manifold means at the bottom of said receptacle, and comprising a conduit on the longitudinal centerline of said receptacle,

(e) means for providing electrolyte to said manifold means under pressure,

(f) a plurality of nozzle defining towers arranged in at least two longitudinally extending rows, said towers projecting upwardly from said manifold means and nozzles directed toward the portion of said path of said workpieces in said receptacle to spray solution on both workpiece surfaces as they move between said towers, comprising upstanding pipes the lower ends of which pipe communicate directly with said conduit to define a space between said pipes for receiving said racks, and rack guiding rails mounted to said pipes for receiving at least the lower edge of said rack therebetween to guide the rack during movement along said portion of said path between said nozzle defining towers or pipes,

(g) a primary electrical power supply,

(h) means for connecting said racks to one terminal of said electrical power source,

(i) means for supporting metal to be plated in said receptacle, said metal support means connected to the other terminal of said electrical power source, and

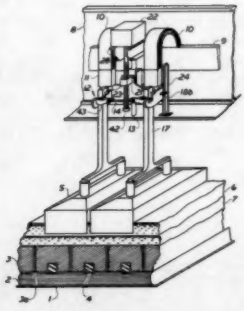
(j) said means for providing electrolyte to said pressure manifold means including pumping means and return manifold means in said receptacle for recirculating the solution and to provide the desired pressure and flow rate of the solution at said nozzles in said towers.

4,394,242

CLAMP, TOOL, AND ELECTROLYSIS CELL ANODE MOUNT

John F. Clark, Pittsburgh, Pa., assignor to Adnovum AG, Horn, Switzerland

Division of Ser. No. 115,621, Jan. 28, 1980, Pat. No. 4,269,673.
This application Oct. 20, 1980, Ser. No. 198,800
Int. Cl.[3] C25C *3/10;* C25D *17/04;* B25B *13/58, 5/04*
U.S. Cl. 204—243 R 6 Claims



1. In a clamp including means for providing a backing against which articles to be clamped can be placed, gate means mounted for pivoting about an axis into and out of confrontation with said backing means, said axis passing through said gate means, gate engaging means for preventing further pivoting of the gate means when the gate means is in confrontation with the backing means, and means for forcing the gate means

toward the backing means at least when the gate means is in confrontation with said backing means, at least the portion of the gate means at said axis moving toward the backing means during operation of the forcing means in forcing the gate means toward the backing means, the means for forcing including a bolt secured at one end in the backing means and extending along said axis, with the gate means pivoting on the bolt, and a nut on the bolt end opposite to the end secured at the backing means, any engagement of the nut with the gate means being insufficient to pivot the gate means into and out of confrontation with said backing means, wherein the improvement comprises the fact that the direction of pivoting of the gate means away from the gate engaging means out of confrontation with said backing means is the same as the rotational direction of loosening of said nut and the direction of pivoting of the gate means toward the gate engaging means into confrontation with said backing means is the same as the rotational direction of tightening of said nut.

4. In an electrolysis cell having a superstructure (8), a clamp as claimed in claim 1, the clamp being adjustably mounted on the super structure for clamping as an article to be clamped, an anode bar (17).

4,394,243

ELECTRODE FOR AN ELECTROCHEMICAL METAL MACHINE PROCESS

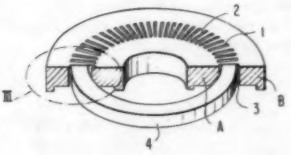
Gerhard Hoffmann, Berglen-Steinach, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 19, 1980, Ser. No. 188,742

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938402

Int. Cl.³ C25B *11/03;* B23P *1/02;* C25F *7/00*

U.S. Cl. 204—284 **9 Claims**



1. An electrode for an electrochemical metal-removing process for a workpiece having an edge, characterized in that the electrode is formed of a metal sheet which extends at right angles to a direction of sinking of the electrode in the metal removing process, the metal sheet is provided with perforations adapted to extend laterally beyond a line defined by said edge to be processed so as to enable the production of end-faced contours,

means disposed against the metal sheet on the side thereof leading in the direction of sinking for insulating a surface coextensive with said perforations to prevent electrochemical metal removal therefrom.

4,394,244

DIAPHRAGMS FOR ALKALINE WATER ELECTROLYSIS AND METHOD FOR PRODUCTION OF THE SAME AS WELL AS UTILIZATION THEREOF

Jiri Divisek, and Jürgen Mergel, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Jul. 7, 1980, Ser. No. 166,448

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1979, 2927566

Int. Cl.³ C25B *13/04*

U.S. Cl. 204—295 **12 Claims**

1. A diaphragm for alkaline water electrolysis and made of a porous sinter material, comprising a porous sinter metal oxidized at least partially to metal oxide of partial oxidation in structure thereof, the partial oxidation penetrating the whole

structure resulting in a sufficiently isolating but mechanically consistent body.

4,394,245

SPUTTERING APPARATUS

Yoshio Homma; Sukeyoshi Tsunekawa, both of Hachioji; Hiroshi Morisaki, Yokohama, and Seiki Harada, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1982, Ser. No. 346,959

Claims priority, application Japan, Feb. 18, 1981, 56-21550

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **11 Claims**

1. A sputtering apparatus comprising at least one cathode and at least one substrate electrode facing the cathode and having an electrode surface plate, the improvement wherein the electrode surface plate of said at least one substrate electrode facing said cathode has at least a portion thereof that is made of a soft magnetic material having an initial permeability of at least 100.

4,394,246

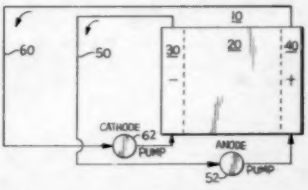
ELECTROPHORESIS APPARATUS WITH FLOW CONTROL

David W. Richman, Chesterfield, and Charles D. Walker, Ballwin, both of Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 24, 1982, Ser. No. 381,049

Int. Cl.³ G01N *27/26, 27/40*

U.S. Cl. 204—301 **7 Claims**



1. In an apparatus for conducting a continuous free flow electrophoresis separation procedure, the apparatus comprising:

a rectilinear buffer filled separation chamber defined by two elongate spaced apart parallel plates forming a front and back to the chamber, two sides, an end comprising a collection manifold having a plurality of spaced apart collection tubes, an end comprising a buffer solution inlet manifold assembly;

two buffer filled electrode chambers, each disposed adjacent to one of the sides of the separation chamber in electrical communication therewith; and

at least one sample inlet port located at or near the inlet of the chamber;

the improvement comprising means for controlling buffer flow across the separation chamber in a direction substantially parallel to an electrical field created between the electrode chambers, the means comprising first and second buffer flow paths, the first flow path connecting the outlet of the first electrode chamber with the inlet of the second electrode chamber, and the second flow path connecting the outlet of the second electrode chamber with the inlet of the first electrode chamber, the buffer solution in each flow path being driven by separate pump means.

4,394,247

LIQUEFACTION OF COALS USING RECYCLABLE SUPERACID CATALYST

George A. Olah, 2252 Gloaming Way, Beverly Hills, Calif. 90210

Filed Aug. 5, 1981, Ser. No. 290,260
Int. Cl.³ C10G *1/06*
U.S. Cl. 208—10 **5 Claims**

1. A process for the liquefaction of coals or other predominantly hydrocarbonaceous materials by treatment thereof with hydrogen gas under superatmospheric pressure of 25–150 atmospheres at temperatures of 50°–250° C. in the presence of a superacidic system comprising anhydrous hydrogen fluoride and boron trifluoride, present in a mole ratio of about 0.5 to 2 to 1.

4,394,248

COAL LIQUEFACTION PROCESS

John G. Gatsis, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 18, 1981, Ser. No. 303,665
Int. Cl.³ C10G *1/06*
U.S. Cl. 208—10 **21 Claims**

1. A process for producing hydrogen-enriched hydrocarbonaceous products from coal which comprises:

(a) contacting said coal in a solvent extraction zone at solvent extraction conditions with a solvent, hydrogen and a residual oil containing asphaltenes and at least one finely divided, unsupported metal sulfide; and

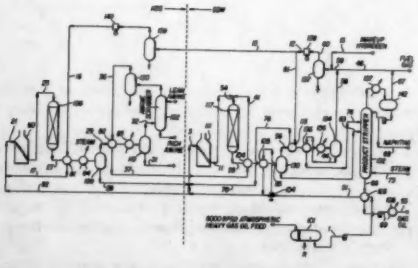
(b) recovering hydrogen-enriched hydrocarbonaceous products.

4,394,249

CATALYTIC DEWAXING PROCESS

Roderick C. Shen, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,026
Int. Cl.³ C10G *47/16*
U.S. Cl. 208—89 **27 Claims**



1. A process for dewaxing at least one petroleum feedstock comprising:

hydrodesulfurizing the feedstock, thereby obtaining a substantially sulfur-free hydrocarbon material;

separating the hydrocarbon material into a gaseous fraction and a liquid fraction;

conducting the liquid fraction directly into a heater of a catalytic dewaxing unit and subsequently into the catalytic dewaxing unit, wherein it is contacted with a highly siliceous zeolite ZSM-5 type porous crystalline material, and conducting an effluent from the catalytic dewaxing unit to a first heat exchanging means;

conducting the gasous fraction into the first heat exchanging means, wherein the gaseous fraction is preheated by the catalytic dewaxing unit effluent; and

conducting the thus-obtained preheated gaseous fraction into the catalytic dewaxing unit.

15. In a catalytic process for dewaxing at least on petroleum feedstock comprising contacting the petroleum feedstock with a highly siliceous ZSM-5 type zeolite porous crystalline material at a temperature of about 550° F. to about 1100° F. and at a pressure of about 15 psig to about 3000 psig, the improvement which comprises desulfurizing the petroleum feedstock prior to the introduction thereof into the catalytic dewaxing process so that the hydrocarbon effluent of the desulfurization step contains less than about 3% by weight of sulfur;

separating the hydrocarbon effluent into a gaseous fraction and a liquid fraction;

conducting the liquid fraction directly into a heater of a catalytic dewaxing unit and subsequently into the catalytic dewaxing unit, wherein it is contacted with a highly siliceous zeolite ZSM-5 type porous crystalline material, and conducting an effluent from the catalytic dewaxing unit to a heat exchanging means;

conducting the gaseous fraction into the first heat exchanging means, wherein the gaseous fraction is preheated by the catalytic dewaxing unit effluent; and

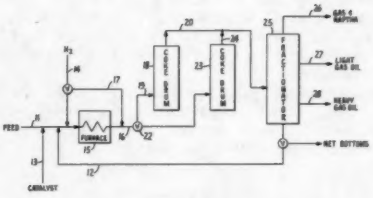
conducting the thus-obtained preheated gaseous fraction into the catalytic dewaxing unit.

4,394,250

DELAYED COKING PROCESS

Arnold L. Grossberg, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 21, 1982, Ser. No. 341,338
Int. Cl.³ C10G *47/26*
U.S. Cl. 208—108 **4 Claims**



1. In a delayed coking process comprising heating a hydrocarbon feedstock to cracking temperatures and thereafter introducing the heated feedstock into a coking drum under delayed coking conditions wherein the heated feedstock soaks in the drum in its contained heat which is sufficient to convert the feedstock to cracked vapors and coke, the improvement comprising adding a cracking catalyst in an amount in the range of about 0.1 to about 3% by weight based on the hydrocarbon feedstock and hydrogen in an amount in the range of about 50 to about 500 SCF per barrel of the hydrocarbon feedstock to the feedstock thereby causing an increase in the distillate yield from the process.

4,394,251

HYDROCARBON CONVERSION WITH CRYSTALLINE SILICATE PARTICLE HAVING AN ALUMINUM-CONTAINING OUTER SHELL

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 28, 1981, Ser. No. 258,496
Int. Cl.³ C10G 47/16, 11/05, 35/095
U.S. Cl. 208—111 15 Claims

1. A hydrocarbon conversion process, comprising contacting, under hydrocarbon conversion conditions, a hydrocarbonaceous feedstock with a particle, comprising an inner portion and an outer portion disposed as a shell around said inner portion wherein said outer portion has the same crystal structure as said inner portion, said inner portion comprising an intermediate pore size crystalline silicate having a silica:alumina mole ratio greater than about 200:1, and said outer portion having a silica:alumina mole ratio of less than about 100:1 and wherein said particle is prepared by a process comprising:

(1) initiating crystallization in a crystallization medium substantially free of aluminum to produce the intermediate pore size crystalline silicate;

(2) adding a source of aluminum to said crystallization medium; and

(3) crystallizing onto said crystalline silicate the isostructural outer portion which comprises alumina.

4,394,252

METHOD OF REFORMING GASOLINE TO RAISE THE OCTANE THEREOF UTILIZING LOW VALENCE TI, V OR CR COMPOSITED WITH NON-OXIDIZING HIGH SURFACE AREA SUPPORT

William K. T. Gleim, 1250 NW. 120th St., Seattle, Wash. 98125

Filed Dec. 29, 1981, Ser. No. 335,447
Int. Cl.³ C10G 35/04, 35/06
U.S. Cl. 208—134 6 Claims

1. In a method of reforming a gasoline feed in the presence of a reforming catalyst to raise the octane number thereof, the improvement which comprises utilizing a reforming catalyst comprising:

(a) a catalytic component selected from the group consisting of titanium, vanadium and mixtures thereof, said catalytic component being present in divalent form or in an admixture of the divalent form and the metal, the ratio of the catalytic component in divalent form to the catalytic component present as the metal being at least 1:1; and

(b) a high surface area support for said catalytic component which will not oxidize said catalytic component at reforming conditions to a valence state higher than the divalent valence state.

4,394,253

HYDROCARBONS HYDROPROCESSING WITH IMOGOLITE CATALYST

Robert A. Van Nordstrand, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 26, 1979, Ser. No. 78,867
Int. Cl.³ C10G 45/08
U.S. Cl. 208—251 H 14 Claims

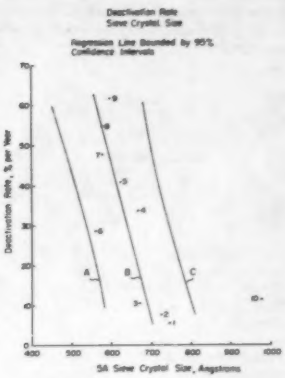
1. A process for hydrogen treating a hydrocarbon feed which comprises contacting said feed, at hydrogen treating conditions, with a catalyst comprising shaped catalytic bodies including (1) dispersed rods of fibrous form imogolite and (2) at least one inorganic oxide gel, said gel bonding said rods together in substantially random mutual orientation in said catalytic bodies, at least 40% of the total pore volume in said catalytic bodies being provided by pores with diameters between about 200 Angstrom units and 1,000 Angstrom units.

4,394,254

METHOD FOR SEPARATING STRAIGHT CHAIN HYDROCARBONS USING ZEOLITES HAVING LARGE CRYSTALS

Paul H. Lewis, Groves, and Gerald V. Nelson, Nederland, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,840
Int. Cl.³ C10G 25/03
U.S. Cl. 208—310 Z 23 Claims



1. A method for separating straight chain hydrocarbons from a hydrocarbon fraction having straight chain hydrocarbons, nonstraight chain hydrocarbons and a sulfur compound comprising the steps of contacting said hydrocarbon fraction having more than about 800 parts per million by weight of total sulfur including more than about 15 parts per million mercaptan with a 5A zeolite which selectively absorbs said straight chain hydrocarbons to the substantial exclusion of said nonstraight chain hydrocarbons, said zeolite having crystals of an average size larger than about 700 angstroms, said crystal size being measured along one edge of the zeolite crystal; and then desorbing said straight chain hydrocarbons from said zeolite.

4,394,255

ISOMERIZATION PROCESS

Semyon Kukes; Gerhard P. Nowack, and Marvin M. Johnson, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 7, 1982, Ser. No. 395,940
Int. Cl.³ C07B 5/23
U.S. Cl. 585—667 6 Claims

1. A process for the isomerization of an aliphatic mono-olefin hydrocarbon feed to shift the internal double bond therein to produce a corresponding terminal olefin which comprises subjecting said mono-olefin hydrocarbon under isomerization conditions to the action of a catalyst comprising zirconium phosphate and zirconium phosphonate wherein the catalyst used is prepared from an aryl phosphonic acid and a compound of zirconium.

4,394,256

APPARATUS FOR SEPARATING ABRASIVE BLASTING MEDIA FROM DEBRIS

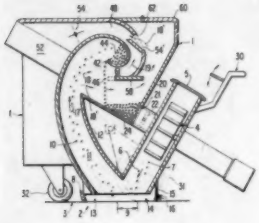
James R. Goff, Rte. 1, Box 247AB, Seminole, Okla. 74868

Continuation-in-part of Ser. No. 232,465, Feb. 9, 1981, Pat. No. 4,364,823. This application Dec. 11, 1981, Ser. No. 330,042
The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.
Int. Cl.³ B07B 7/04
U.S. Cl. 209—135 31 Claims

1. An apparatus for separating debris from spent abrasive in

an abrasive blasting apparatus in which the debris and spent abrasive are recirculated from a blast zone at high speed along a recirculation chamber comprising

means for receiving said debris and spent abrasive from said recirculation chamber and allowing a quantity of said debris and spent abrasive to collect thereby forming a pile of said debris and spent abrasive with a face of said pile exposed to incoming debris and spent abrasive from said recirculation chamber; wherein said pile has an angle of repose whereby additional incoming debris and spent abrasive fall down said face to form a substantially unobstructed, vertical, uniform curtain of falling debris and spent abrasive;



means for providing a stream of fluid through said recirculation chamber;

means having a first opening below said receiving means for drawing off a first portion of said stream of fluid from said recirculation chamber;

wherein said drawing means has a second opening for the passage therethrough of a second portion of said stream of fluid not passing through said first opening; and

whereby said falling curtain of debris and spent abrasive is washed by said stream of fluid as it passes from said recirculation chamber to said drawing means to entrain debris from said falling curtain in said stream of fluid.

4,394,257

FROTH FLOTATION PROCESS

Samuel S. Wang, Cheshire, and Michael J. Scanlon, Stratford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 95,839, Nov. 19, 1979, abandoned. This application Jun. 21, 1982, Ser. No. 390,574

Int. Cl.³ B03D 1/14

U.S. Cl. 209—166 **14 Claims**

1. A process for collecting mineral values from a sulfide ore wherein said process comprises mixing ground ore with water to form an aqueous ore pulp, adding to said aqueous ore pulp an effective amount of a frother, aerating said aqueous ore pulp and thereafter recovering said mineral values, wherein the frother is of the general structure:

$$\left[\begin{array}{c} X \\ | \\ R-W-[C]_n-Z \\ | \\ Y \end{array}\right] \quad \begin{array}{c} X \\ | \\ R-W-[C]_n-C\equiv N \\ | \\ Y \end{array}$$

wherein R is taken from the group consisting of a saturated aliphatic radical of 1 to 12 carbon atoms, inclusive, a phenyl and an alkylaryl wherein the alkyl group consists of a saturated aliphatic radical of 1 to 6 carbon atoms, inclusive, W is taken from the group consisting of oxygen, imino and alkyl substituted imino wherein the alkyl radical consists of a saturated aliphatic radical of 1 to 12 carbon atoms, inclusive, n is an integer of 1 to 4, inclusive, and X and Y are individually either hydrogen or a saturated aliphatic radical of 1 to 8 carbon atoms, inclusive.

8. A process for collecting mineral values from an ore wherein said process comprises mixing ground ore with water to form an aqueous ore pulp, adding to said aqueous ore pulp an effective amount of a frother, aerating said aqueous ore pulp and thereafter recovering said mineral values, wherein the frother is of the general structure:

$$\begin{array}{c} X \\ | \\ R-S-[C]_n-Z \\ | \\ Y \end{array}$$

wherein R is taken from the group consisting of a saturated aliphatic radical of 1 to 12 carbon atoms, inclusive, a phenyl and an alkylaryl wherein the alkyl group consists of a saturated aliphatic radical of 1 to 6 carbon atoms, inclusive; n is an integer of 1 to 4, inclusive, X and Y are individually either hydrogen or a saturated aliphatic radical of 1 to 8 carbon atoms, inclusive; and Z is taken from the group consisting of

$$-C\equiv N, \quad \begin{array}{c} O \\ \| \\ -C-NH_2 \end{array} \text{ and } -O-R'''$$

wherein R'' and R''' are aliphatic radicals having 1 to 8 carbon atoms, inclusive.

4,394,258

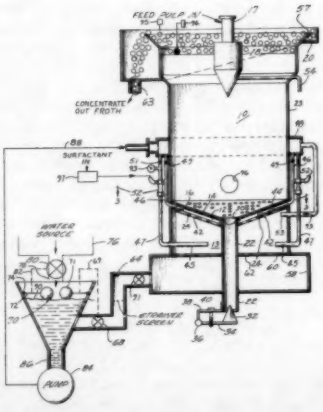
FROTH FLOTATION APPARATUS WITH WATER RECOVERY AND METHOD

Donald E. Zipperian, Tucson, Ariz., assignor to The Diester Concentrator Co., Inc., Fort Wayne, Ind.

Filed Jun. 25, 1981, Ser. No. 276,809

Int. Cl.³ B03D 1/24

U.S. Cl. 209—170 **31 Claims**



1. Apparatus for separation of minerals from an aqueous pulp containing a mixture of mineral and gangue particles by froth flotation compising:

an upstanding flotation compartment adapted to contain a relatively quiescent body of aqueous pulp,

feed means for introducing aqueous pulp into said flotation compartment,

froth-collecting means disposed adjacent to the upper end of said flotation compartment for collecting a float fraction of said aqueous pulp, aeration means for applying aerated water to said flotation compartment near the bottom

whereby bubbles of air are introduced throughout substantially the entire cross-section of said flotation compartment,

said aeration means including a constriction plate substantially spanning said flotation compartment, said constriction plate having a plurality of bubble-receiving apertures spaced throughout the area thereof,

tailing-discharge means for discharging an aqueous non-float fraction of unfloated particles of said aqueous pulp from said flotation compartment, water-collecting means below said constriction plate for receiving water from said aeration means, means for inhibiting passage of said non-float fraction from said flotation compartment to said water-collecting means, and pump means for pumping water from said water-collection means back to said aeration means, whereby the water that is collected is recirculated and aerated for application to said flotation compartment.

4,394,259

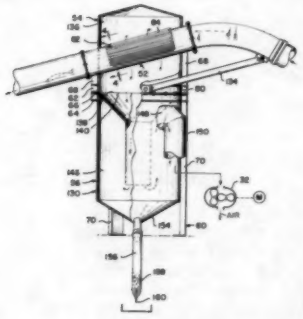
VACUUM PNEUMATIC CONVEYING APPARATUS AND METHOD FOR TRANSFERRING FOOD PRODUCTS

John R. Benny, Seattle; Robert W. Buber, Kent, and Paul K. Smith, Kirkland, all of Wash., assignors to TEMCO, Inc., Bellevue, Wash.

Filed Oct. 27, 1981, Ser. No. 315,368

Int. Cl.³ B03B 7/00; A22C 25/08

U.S. Cl. 209—250 **20 Claims**



1. A vacuum pneumatic conveying apparatus utilized to convey food products, such as to convey fish from a fishing boat to a fish tender or to a processing factory keeping the fish from being injured via avoiding damaging contact with any of this apparatus, comprising:

(a) a frame assembly of a horizontal base, a vertical support high rise support on this base, and a separator support on this vertical support;

(b) a combined assembly of an in line upper primary product separator, and a lower secondary liquid separator mounted on the frame assembly via the separator support and the vertical high rise support at a substantial elevation above the horizontal base, with this upper primary product separator to separate the fish from the air, essentialy being a chamber with an open bottom having inside a downwardly directed internal conduit which extends from its top outside entry downwardly and outwardly to its lower outside exit and this internal conduit has an upwardly and sideways facing longitudinally grilled air exit to allow the air to escape into this chamber of the upper primary product separator, and with the secondary liquid separator to separate liquid from air, essentially being a chamber with an open top to match the open bottom of the chamber of the upper primary product separator, having: a funnel like central interior passage; a higher circumferentially located air exit for air enroute toa blower; and a lower centered gurry and liquid exit;

(c) a rotary positive displacement blower mounted on the horizontal base of the frame assembly, and having a conduit connected from its inlet blow, to the higher circumferentially located air exit above of the secondary liquid separator, and having its exit directing the exhaust air to a silencer, and having a silencer to direct the exhaust air into the atmosphere at a convenient location;

(d) a movable inlet depending conduit to receive and to guideably fly fish from its point of inlet, having a nozzle, which is moved about in a hold of a fishing boat, with fish thereafter flying up through this inlet to the combined assembly above of the in line upper primary product separator, and the lower secondary liquid separtor, and having at its top, an exit fastening assembly for joining this movable inlet with the top outside entry of the inside downwardly directed internal conduit positioned within the chamber of the upper primary product separator;

(e) a movable outlet depending conduit to receive and to guide fish leaving the lower outside exit above, of the downwardly directed internal conduit within the chamber of the upper primary product separator, with their momentum assuring their continuation of travel by gravity downwardly to be collected and then discharged for example on sorting conveyors of a fish processing factory, having at its entry a fastener assembly for joining with the lower outside exit of the downwardly directed internal conduit, and having at its exit an easily manipulated self sealing flexible discharge sleeve capable of holding back a sufficient changing group of fish until their combined weight overcomes the barometric pressure head, to thereafter intermittently force open this otherwise self sealing flexible discharge sleeve; and

(f) a smaller movable outlet depending conduit to receive and to guide gurry and liquid leaving the combined assembly of the in line upper primary product separator and the lower secondary liquid separator, having a fastener assembly for joining it to the lower secondary liquid separator, which in turn has the lower centered gurry and liquid exit to also receive the fastener assembly, and having a self sealing flexible discharge sleeve capable of holding back a sufficient temporarily collecting grouping of particles of gurry and liquid, until their combined weight overcomes the barometric pressure head, to thereafter intermittently force open this otherwise self sealing flexible discharge sleeve and the departing liquid and gurry is collected, eventually to be disposed of as waste or a waste product.

4,394,260

CONTROL DEVICE FOR A ROTARY VALVE-CONTROLLED JIGGING MACHINE

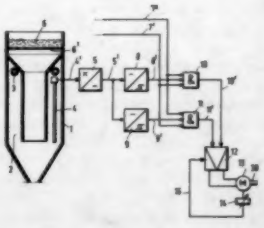
Siegfried Heintges, Haltern; Werner Strauss, and Karl-Heinz Weiffen, both of Bochum, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Oct. 15, 1981, Ser. No. 311,873

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 3038921

Int. Cl.³ B03B 5/24

U.S. Cl. 209—500 **9 Claims**



1. Apparatus for controlling a rotary valve jigging machine which has an air chamber disposed in a separating liquid below

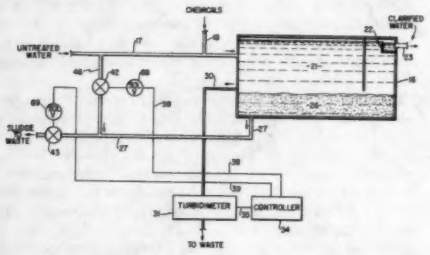
a jigging screen and air is supplied to and exhausted from the air chamber through inlet and outlet air lines, respectively, comprising: sensing means in the air chamber for producing an electrical signal corresponding to the stroke of the liquid pulsations; an outlet throttling valve in said outlet air line; and control means connected between said sensing means and said throttling valve for adjusting said throttling valve in response to the electrical signal being outside predetermined limits, said control means comprising first and second means connected to said sensing means and responsive to the magnitude of said electrical signal to produce respective first and second signals when said electrical signal transgresses respective predetermined upper and lower threshold values, and electrical servomechanism means connected between said first and second means and said throttling valve for adjusting said throttling valve in response to said first and second signals.

4,394,261

SYSTEM FOR CONTROLLING CLARIFICATION OF BOILER FEED WATER AND THE LIKE

Henry D. Moser, Post Falls, Id., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 5, 1982, Ser. No. 355,007
Int. Cl.³ C02B *1/20*
U.S. Cl. 210—96.1 2 Claims



1. In combination with a system for controlling clarification of boiler feed water and the like by precipitation, said system comprising

a settling tank having an inlet and an outlet for said water,

means for adding a chemical to said inlet water to cause said precipitation,

a drain line and first valve means for drawing off precipitate from the bottom of said tank,

a small sampling line connected into said tank at a predetermined level above the bottom of said tank for continuously sampling water from said tank,

means for continuously measuring turbidity of said sampled water, comprising

a switch having a closed position if said turbidity exceeds a predetermined minimum and an open position if not, and

means for backwashing said precipitate draw-off, comprising

a second valve means for controlling flow through a connecting line between said inlet water and said drain line while said first valve means is closed,

timing and control means for checking said turbidity at first predetermined intervals and for activating said first valve means for second predetermined intervals if said turbidity exceeds a predetermined minimum and for activating said second valve means with disabling of said first valve means at third predetermined regular intervals,

said timing and control means comprising

first timing means for opening said first valve means for said second predetermined intervals,

first circuit means for connecting said turbidity switch to said first timing means for activating said first timing means only when said turbidity exceeds said predetermined minimum

second timing means for checking said turbidity at said first predetermined intervals,

second circuit means for connecting said second timing means to said first timing means for activating said second timing means whenever said turbidity switch is closed, and

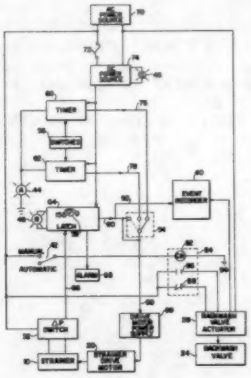
third timing means for opening said second valve means at said third predetermined regular intervals.

4,394,262

SYSTEM FOR MINIMIZING BACKWASH WATER USAGE ON SELF-CLEANING STRAINERS

Ronald G. Bukowski, and Timothy L. Johnson, both of Erie, Pa., assignors to Zurn Industries, Inc., Erie, Pa.

Filed Aug. 6, 1982, Ser. No. 406,580
Int. Cl.³ B01D *29/38*
U.S. Cl. 210—103 8 Claims



1. In an automatic backwashing strainer system including a backwashing strainer with a backwash outlet; a backwash valve for controlling the flow of backwash water through the backwash outlet; an actuator operating the backwash valve, and control means for automatically activating the actuation, the improvement in said control means comprising:

(a) a first timer which periodically produces a first control signal for a variable duration and with a variable cycle time;

(b) a second timer which periodically produces a second control signal for a variable duration and with a variable cycle time, wherein the duration of the second control signal is shorter than the duration of the first control signal and the cycle time of the second control signal is longer than the cycle time of the first control signal;

(c) a differential pressure switch which produces a differential pressure signal whenever the pressure drop across the strainer exceeds a predetermined upper limit and maintains said differential pressure signal until said pressure drop reaches a predetermined lower limit;

(d) a latch responsive to the differential pressure signal which produces a third control signal while the differential pressure switch is activated and which maintains the third control signal for a variable time delay after the pressure drop across the strainer reaches the predetermined lower limit;

(e) means for varying the duration and cycle time of the first and second control signals;

(f) means for varying the time delay of the third control signal; and

(g) means for selecting, in response to operating conditions of the backwashing strainer system, one or more of said control signals to activate the actuator, such that the

strainer is cleaned with a minimum usage of backwash water.

4,394,263

CONNECTING DEVICE FOR PNEUMATIC AND/OR HYDRAULIC CIRCUITS IN COLUMN CHROMATOGRAPHY

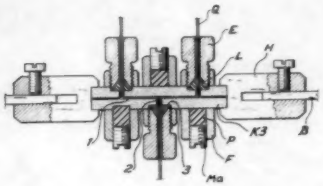
Werner Dosch, Mainz, and Heinz Wagner, Mainz-Marienbord, both of Fed. Rep. of Germany, assignors to Carlo Erba Strumentazione S.p.A., Rodano, Italy

Filed Dec. 4, 1981, Ser. No. 327,548

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1980, 3045654

Int. Cl.[3] **B01D** *15/08*

U.S. Cl. 210—198.2 **15 Claims**



1. A connecting device for use in pneumatic and/or hydraulic circuits, to be used in separation techniques, as in capillary column chromatography, for systems of partition and commutation of a fluid flow carrying a sample to be analyzed, in which chemically inert gaskets and fittings are used, comprising: a pneumatic or hydraulic distribution panel (**S1**) which comprises at least a mechanically stable, thick wall glass or fused silica body (**K1, K2, K3**), having a capillary channel (**1**) therein, and further having a series of side fittings in the form of transverse holes (**2**), to define a multiple T-fitting, said transverse holes (**2**) housing capillary tubes (Q) adapted for conveying gas or liquid, and said capillary tubes (Q) being constructed such that their ends are easily removable, pneumatically sealed and substantially free from dead volumes; said holes (**2**) having an inlet in the thick-wall body (**K1, K2, K3**) which is flattened to provide a bearing surface (**3**) for a gasket, and said thick-wall body (**K1, K2, K3**) carrying holding couplings (F), each of which can be fixed in correspondence with a hole (**2**), and each coupling (F) having a set screw (E) adapted for sealingly securing the end of a tube (Q) inserted in a transverse hole (**2**) through a gasket (L) pressing on said bearing surface (**3**).

4,394,264

MAGNETIC LIQUID FILTER

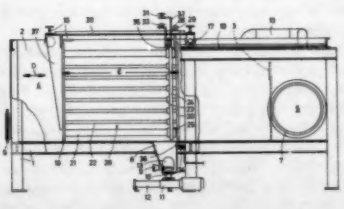
Werner Schimion, Hilchenbach, and Josef Herbrand, Brühl, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 16, 1981, Ser. No. 302,759

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1980, 3035003

Int. Cl.[3] **B01D** *35/06;* **B03C** *1/06;* **C02F** *1/48*

U.S. Cl. 210—222 **26 Claims**



25. A machine for filtering particles, in particular magnetically attractable particles, from a liquid, said machine comprising:

a housing having a vessel;

a weir in said vessel subdividing same into an elongated treatment compartment having a predetermined compartment length and an outlet compartment, said housing being formed in said treatment compartment with a sump;

means for introducing a liquid to be cleaned into said treatment compartment and for withdrawing liquid from said outlet compartment;

a carriage displaceable longitudinally on said vessel above said treatment compartment and suspending a vertical carriage frame in said treatment compartment;

an array of horizontally extending spaced magnetic bars carried on said carriage frame in said treatment compartment, said bars each having a bar length measured parallel to said treatment compartment that is substantially less than said compartment length;

respective scrapers fixed on said housing above said sump and engaging said bars;

respective annular nozzles fixed on said scrapers surrounding and directed at the respective bars;

means for feeding a fluid under pressure to said nozzles to direct annular fluid streams at the respective bars and thereby loosen particles from the bars adjacent the scrapers;

means for displacing said carriage with said bars longitudinally relative to said housing and scrapers through a distance equal generally to said bar length and thereby scraping particles off said bars, whereby the particles freed from said bars drop in said treatment compartment; and

means for withdrawing liquid from said sump.

26. A machine for filtering particles, in particular magnetically attractable particles, from a liquid, said machine comprising:

a housing having a vessel;

a weir in said vessel subdividing same into an elongated treatment compartment having a predetermined compartment length and an outlet compartment, said housing being formed in said treatment compartment with a sump;

means for introducing a liquid to be cleaned into said treatment compartment and for withdrawing liquid from said outlet compartment;

a carriage displaceable longitudinally on said vessel above said treatment compartment and suspending a vertical carriage frame in said treatment compartment, said frame including horizontally spaced end members each having a plurality of vertically and horizontally spaced holes;

an array of horizontally extending spaced magnetic bars carried on said carriage frame in said treatment compartment, said bars each having a bar length measured parallel to said treatment compartment that is substantially less than said compartment length, said bars further having respective ends received in the respective holes of the end members, said ends of said bars being each formed with a radially outwardly open groove, each of said end members being provided with a slidable element engageable in the respective grooves;

respective scrapers fixed on said housing above said sump and engaging said bars and including nozzles directed at the respective bars;

means for feeding air under pressure to said nozzles.;

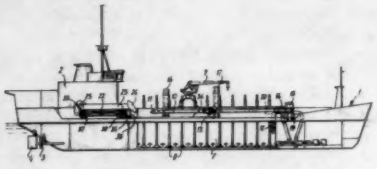
means for displacing said carriage with said bars longitudinally relative to said housing and scrapers through a distance equal generally to said bar length and thereby scraping particles off said bars, whereby the particles scraped off said bars drop in said treatment compartment; and

means for withdrawing liquid from said sump.

4,394,265
VESSEL IN PARTICULAR SUCTION DREDGER PROVIDED WITH MEANS FOR REMOVING OIL FROM A WATER SURFACE

Nicolaas J. van Drimmelen, Alblasserdam; James P. Barneveld Binkhuysen, Papendrecht; Johan van Renssen, Maassluis, and Pieter Verboom, Alblasserdam, all of Netherlands, assignors to IHC Holland N.V., Papendrecht, Netherlands

Filed Dec. 20, 1979, Ser. No. 105,530
Int. Cl.³ E02B 15/04
U.S. Cl. 210—242.3 **18 Claims**

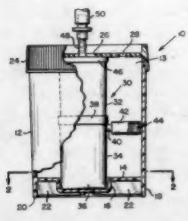


1. In a suction dredger comprising a vessel having a hold for the storage of dredged material, means for emptying said hold, a suction conduit with a suction head, a suction-pressure pump in the suction conduit having a pressure conduit debouching within the hold, said vessel having its own power and control means, collecting means positionable at the side of the vessel and adapted to intersect the water surface and having means for sucking up oil floating upon the water surface and collected by the collecting means, said vessel having tanks for the storage of the sucked up oil-water mixture; the improvement in which said tanks are comprised by the open hold of the vessel normally serving for the storage of dredged material and the means for sucking up oil have said pressure conduit debouching into said hold, each said collecting means comprising a sweeping arm connected to a connection arm which is connected swingably about at least a horizontal axis to a carrier attached to the edge of the deck, said connection arm extending rearwardly from said carrier and having its rear end carrying the sweeping arm via a universal joint.

4,394,266
PRESSURE FILTER ADAPTER AND CONTAINMENT VESSEL

Ravinder C. Mehra, Fairport, and Raj K. Aggarwal, Penfield, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,435
Int. Cl.³ B01D 35/14
U.S. Cl. 210—244 **2 Claims**



1. A containment vessel for receiving a vacuum filter unit comprising.

(a) a hollow cylindrical body having a closed bottom portion, a cylindrical side wall upstanding from said bottom portion, and an open top;

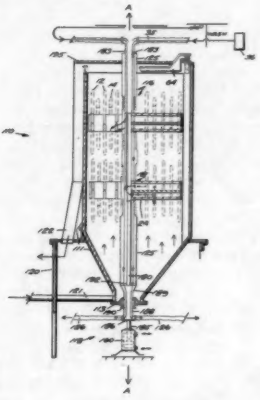
(b) said bottom portion including a raised floor defining a cylindrical well extending below the plane of said floor for accommodating the base of the filter unit, said well being located off center relative to said bottom providing a varying radial clearance between said filter unit and said sidewall around their respective circumferences; and

(c) a screw closure for said open top, said closure having a first central opening through which to communicate with said filter unit and a second vent opening radially spaced from said central opening.

4,394,267
DIFFUSER ASSEMBLY

Johan C. F. C. Richter, Oslo, Norway, and Ole J. Richter, Karlstad, Sweden, assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Jul. 12, 1982, Ser. No. 397,407
Int. Cl.³ B01D 33/00
U.S. Cl. 210—331 **12 Claims**



1. In an elongated upright hollow vessel which includes side and bottom walls, the improvement comprising: a plurality of withdrawal screens extending substantially parallel to the vessel direction of elongation, and spaced from each other in directions perpendicular to the vessel direction of elongation; non-rotatable conduit means for supporting said withdrawal screens and for providing for passage of fluid from said withdrawal screens to an area remote from said withdrawal screens and exterior of said vessel; means for only reciprocating said conduit means with attach withdrawal screens up and down in a direction substantially coincident with the direction of elongation of the vessel; and means for introducing fluent material to be treated into said vessel and withdrawing treated fluent material therefrom; and

said means for only reciprocating consisting essentially of a linear actuator located below the bottom wall of said vessel within the cross-sectional area of the vessel, for avoiding boiling problems as a result of liquor suck-up during start-up; and wherein said conduit means for providing passage of fluid from said withdrawal screens includes a central conduit substantially concentric with said linear actuator and reciprocal with said linear actuator, said central conduit operatively passing through the bottom wall of said vessel.

4,394,268

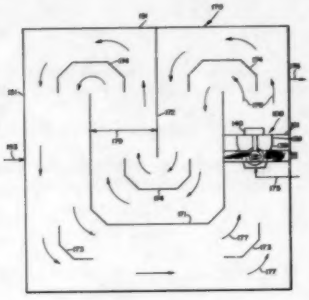
CONVERSION OF PLUG FLOW AND COMPLETE MIX AERATION BASINS TO BARRIER OXIDATION DITCHES

John H. Reid, 7 Stansbury Ct., Fredericksburg, Va. 22401

Division of Ser. No. 28,383, Apr. 9, 1979, which is a division of Ser. No. 957,432, Nov. 3, 1978, which is a continuation-in-part of Ser. No. 848,705, Nov. 4, 1977, which is a continuation-in-part of Ser. No. 649,995, Jan. 19, 1976, abandoned. This application Sep. 14, 1979, Ser. No. 75,412

Int. Cl.³ C02F *3/20*

U.S. Cl. 210—628 25 Claims



1. A method for converting a reactor basin of an activated sludge waste water treatment process, said reactor basin including at least one aerating device, to a barrier oxidation ditch, said method comprising the steps of:

(a) removing said at least one aerating device;

(b) forming an endless channel within said reactor basin, said endless channel having substantially parallel sides and a floor; and

(c) placing a single barriered circulator/aerator within said endless channel, said barriered circulator/aerator comprising:

(1) barrier means for separating mixed liquor within said endless channel into upstream liquor within an intake channel and downstream liquor within a discharge channel, and providing hydraulic support to said downstream liquor;

(2) a flow passage through said barrier means for providing fluid communication between said intake channel and said discharge channel;

(3) at least one pump means disposed within said fluid communication passage for propelling said upstream liquor through said passage from said intake channel to said discharge channel, around said endless channel back to said intake channel, and

(4) at least one aeration means disposed within said fluid communication passage for dispersing an oxygen-containing gas into said propelled upstream liquor to form freshly aerated mixed liquor.

4,394,269

METHOD FOR CLEANING SOLUTION USED IN NUCLEAR FUEL REPROCESSING

Othar K. Tallent, Oak Ridge; Karen E. Dodson, Knoxville, and James C. Mailen, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 12, 1981, Ser. No. 262,831

Int. Cl.³ G21F *9/12*

U.S. Cl. 210—690 3 Claims

1. A method of processing a solution containing (1) a hydrocarbon diluent, (2) a phosphate selected from the group consisting of tri-n-butyl phosphate and tri-2-ethylhexyl phosphate, and (3) a degradation product selected from the group consisting of (a) monobutyl phosphate, (b) dibutyl phosphate, (c) mono-2-ethylhexyl phosphate, (d) di-2-ethylhexyl phosphate, and (e) a complex of plutonium, uranium, or a fission product thereof with monobutyl phosphate, dibutyl phosphate, mono-2-ethylhexyl phosphate, or di-2-ethylhexyl phosphate, comprising contacting said solution with silica gel having alkali metal ions absorbed thereon.

4,394,270

APPARATUS FOR THE CHEMICAL CONDITIONING OF SLUDGES

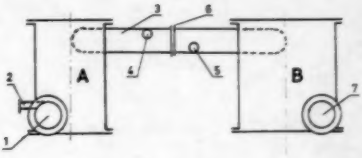
Achim Hartmann, Pulheim, and Dieter Schinkitz, Leverkusen, both of Fed. Rep. of Germany, assignors to Kronos Titan-G.m.b.H., Fed. Rep. of Germany

Filed Aug. 3, 1981, Ser. No. 289,441

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030558

Int. Cl.³ C02F *11/14*

U.S. Cl. 210—726 24 Claims



1. An apparatus for the conditioning of sludges comprising:

a. first and second vertically arranged cylindrical vessels, each vessel having a sealed bottom and a sealed top;

b. an overflow pipe connecting the first and second cylindrical vessels installed tangentially to the upper portions of the first and second cylindrical vessels;

c. a sludge feed pipe connected to a source of sludge, said sludge feed pipe being installed in a direction tangentially opposite the overflow pipe above the bottom of the first vessel;

d. a feed tube connected to a source of a first conditioning material, said feed tube being installed tangentially into the sludge feed pipe;

e. two further feed tubes being respectively connected to sources of a second and a third treating material, said two further feed tubes being installed tangentially into the overflow pipe; and

f. a discharge pipe installed in a direction tangentially opposite the overflow pipe above the bottom of the second vessel, said apparatus being further constructed and arranged whereby the sludge entering the sludge feed pipe is mixed with the first conditioning material, spirals upward through the first vessel, passes through the overflow pipe wherein it is mixed with the second and third conditioning material, passes into the second vessel, spirals downward thereby further mixing the sludge and the conditioning materials and is discharged through the discharge pipe.

6. A process for the conditioning of sludge comprising:

a. feeding sludge to the lower part of a first vertically arranged cylindrical vessel having a sealed bottom and a sealed top;

b. treating the sludge by the addition of a flocculant;

c. mixing the sludge and flocculant in an intensive manner by conveying the sludge and flocculant in a spiral flow upward through the first vessel to form a sludge mixture;

d. transferring the sludge mixture to the upper part of a second vertically arranged cylindrical vessel having a sealed bottom and a sealed top;

e. adjusting the pH of the sludge mixture by the addition of a fluid neutralizing agent;

f. mixing the sludge mixture and neutralizing agent in an intensive manner by conveying the sludge mixture and neutralizing agent in a spiral flow downward through said

second vessel to form a homogeneous conditioned sludge; and

g. recovering the conditioned sludge.

4,394,271

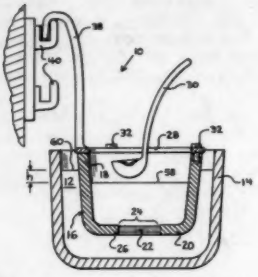
APPARATUS AND METHOD FOR FILTRATION OF MOLTEN METAL

Daniel E. Groteke, 1228 Ridge Cliff Rd., Cincinnati, Ohio 45215

Filed Apr. 23, 1981, Ser. No. 256,829

Int. Cl.³ C22B 9/02

U.S. Cl. 210—773 **18 Claims**



1. A liquid metal filter apparatus for purifying a metal bath, comprising:

a crucible having a rim and a bottom;

a portion of said crucible being a porous ceramic material having an open cell structure characterized by a plurality of interconnected pores, said ceramic material serving as a filter;

a shock resistant ring attached to said rim;

a brace rigidly attached to said ring; and

a bracket rigidly positioned external to the molten metal bath and said brace being attached to said bracket for rigidly positioning said crucible with respect to the molten metal bath.

15. A method for filtration of liquid metal from a molten bath comprising:

providing a crucible with a rim and a ring attached thereto, said ring being more shock resistant than said crucible, said crucible having a bottom with a passage therethrough which is fitted with a porous filter;

submerging said filter into said liquid metal while maintaining said rim above the surface of said liquid metal;

rigidly positioning said crucible with respect to the molten metal bath by means of a brace rigidly attached to said ring and to a bracket external to said liquid metal bath;

allowing liquid metal to pass through said filter to fill said crucible; and

extracting said liquid metal from said crucible.

4,394,272

LIQUID CLARIFIER AND METHOD

Herbert R. Damerau, Farmington Hills, Mich., assignor to Pecor Corporation, Taylor, Mich.

Filed Nov. 17, 1980, Ser. No. 207,214

Int. Cl.³ B01D 29/38

U.S. Cl. 210—779 **17 Claims**

1. A liquid clarifier comprising, in combination:

a settling tank;

a clean-liquid tank;

a filter between the tanks through which liquid flows from the settling to the clean-liquid tank;

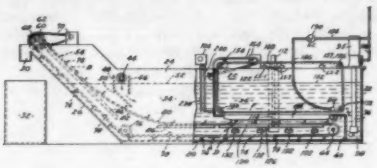
a flight conveyor in the settling tank having a forwarding run arranged to scrape the bottom of the settling tank and move sludge to a discharge chute and a return run arranged adjacent the filter; and

means for selectively positioning the conveyor return run either close to the filter to scrape a filter cake formed thereon or position the return run in spaced non-scraping relation.

17. The method of clarifying a liquid comprising:

delivering the liquid to a settling tank;

holding the liquid in the tank to allow contaminates to settle therefrom;



removing sludge from the tank by arranging a flight conveyor so that a forwarding run scrapes the bottom of the tank;

moving liquid in the settling tank through a filter into a clean tank; and

shifting the return run of the flight conveyor into and out of scraping relation with the filter in accordance with the clogged condition thereof.

4,394,273

DEFOAMERS FOR AQUEOUS LIQUIDS CONTAINING SOLUBLE ZINC SALTS

Michael H. Hoff, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Dec. 10, 1981, Ser. No. 329,350

Int. Cl.³ C09K 7/02; E21B 43/00; B01D 19/04

U.S. Cl. 252—8.55 R **9 Claims**

1. A defoaming composition comprising a mixture of 2,6,8-trimethyl-4-nonanone and the triethoxylated derivative of 2,6,8-trimethyl-4-nonanol wherein the volume ratio of 2,6,8-trimethyl-4-nonanone to the triethoxylated derivative of 2,6,8-trimethyl-4-nonanol is in the range from about 9:1 to about 1:9.

4,394,274

Patent Not Issued For This Number

4,394,275

COMPOSITE MATERIAL FOR SLIDING SURFACE BEARINGS

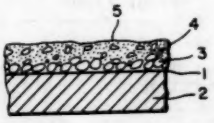
Wolfgang Bickle, Reilingen; Rolf Funke, Bad Schönborn, and Rolf Pfoh, Rauenberg, all of Fed. Rep. of Germany, assignors to Karl Schmidt GMBH, Neckarsulm, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,394

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027409

Int. Cl.³ C10M 5/18

U.S. Cl. 252—12 **8 Claims**



1. A composite material for a sliding surface bearing comprising a supporting shell of steel, which is covered by a bearing metal layer comprising sintered porous bronze having a porosity of 25 to 45%, the voids of which are filled with a fluorocarbon-lead mixture comprising 30 to 60% by weight polyvinylidene fluoride and 20 to 50% by weight lead, said bearing metal layer in turn covered by an anti-friction layer comprising 30 to 60% by weight polyvinylidene fluoride and

20 to 50% by weight lead, said anti-friction layer having pockets or grooves therein containing a lubricant.

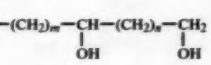
4,394,276

METHOD FOR IMPROVING FUEL ECONOMY OF INTERNAL COMBUSTION ENGINES USING SULFUR-CONTAINING ALKANEDIOLS

Vernon R. Small, Jr., Rodeo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 26, 1981, Ser. No. 314,630
Int. Cl.³ C10M 1/38, 1/20
U.S. Cl. 252—32.7 E 14 Claims

1. A lubricating oil composition comprising a major proportion of an oil of lubricating viscosity and a minor effective amount of a sulfur-containing alkane diol fricton-reducing additive of the formula



wherein R is alkyl containing from 5 to 30 carbon atoms, m is 1 or 2 and n is 0 or 1.

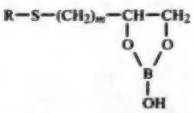
4,394,277

METHOD FOR IMPROVING FUEL ECONOMY OF INTERNAL COMBUSTION ENGINES USING BORATED SULFUR-CONTAINING 1,2-ALKANE DIOLS

Vernon R. Small, Jr., Rodeo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 26, 1981, Ser. No. 314,631
Int. Cl.³ C10M 1/54, 1/38
U.S. Cl. 252—32.7 E 19 Claims

1. A borated sulfur-containing 1,2-alkane diol of the formula



wherein R is alkyl containing 5 to 30 carbon atoms and m is 1 or 2.

4,394,278

FRICTION REDUCING ADDITIVES AND COMPOSITIONS THEREOF

Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Clementon, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 26, 1981, Ser. No. 267,105
Int. Cl.³ C10M 1/54, 5/22; C07F 5/04
U.S. Cl. 252—46.3 19 Claims

1. A reaction product produced by (1) reacting a hydrolyzed imidazoline with a mercaptan and an aldehyde, followed by (2) reacting the product of (1) with a boron compound.

8. A lubricant or liquid hydrocarbon fuel composition comprising a major proportion of a lubricant or fuel and an antifriction or antioxidant amount of a product produced by (1) reacting a hydrolyzed imidazoline with a mercaptan and an aldehyde, followed by (2) reacting the product of (1) with a boron compound.

4,394,279

ANTIOXIDANT COMBINATIONS OF SULFUR CONTAINING MOLYBDENUM COMPLEXES AND AROMATIC AMINE COMPOUNDS FOR LUBRICATING OILS

Louis deVries, Greenbrae, and John M. King, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 7, 1981, Ser. No. 290,914
The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.
Int. Cl.³ C10M 1/20, 1/32, 1/38, 1/54
U.S. Cl. 252—46.4 17 Claims

1. A lubricating oil additive comprising a combination of

(a) an oil soluble sulfur containing molybdenum complex prepared by (1) reacting an acidic molybdenum compound and a basic nitrogen compound selected from the group consisting of a succinimide, carboxylic acid amide, Mannich base, phosphonamide, thiophosphonamide, phosphoramide, dispersant viscosity index improvers, or mixtures thereof to form a molybdenum complex wherein from 0.01 to 2 atoms of molybdenum are present per basic nitrogen atom, and (2) reacting said complex with carbon disulfide in an amount to provide 0.1 to 4 atoms of sulfur per atom of molybdenum, and

(b) an oil soluble aromatic amine compound or mixtures thereof, wherein the aromatic amine compound of component (b) is present in an amount of from 0.02 to 10 parts by weight per part by weight of the sulfur containing molybdenum complex of component (a).

4,394,280

ION CONDUCTIVE MIXED CRYSTAL

Ulrich von Alpen, Schlossborn; Reinhard Bräutigam, Hofheim, and Antony Oliapuram, Frankfurt, all of Fed. Rep. of Germany, assignors to Varta Batterie A.G., Hanover, Fed. Rep. of Germany

Filed Apr. 19, 1982, Ser. No. 369,364
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1981, 3123099
Int. Cl.³ H01G 9/02
U.S. Cl. 252—62.2 2 Claims

1. A mixed crystal for use as the ion conductive solid electrolyte in galvanic elements formed of the components Na_2O, ZrO_2, P_2O_5 and SiO_2, wherein the composition is expressed by the general formula

$$Na_{1+\alpha x}Zr_{2+2\frac{1}{3}x-\alpha x}Si_xP_{3-x}O_{12\frac{1}{3}x},$$

a being a constant with a numerical value between 0.8 and 0.9 and x being a variable parameter with numerical values of 1.8 to 2.3.

4,394,281

COMPOSITION FOR USE IN A MAGNETICALLY FLUIDIZED BED

Ronald E. Rosensweig, Summit, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 218,087, Dec. 19, 1980, Pat. No. 4,368,131, which is a continuation-in-part of Ser. No. 943,384, Sep. 18, 1978, abandoned. This application Sep. 22, 1982, Ser. No. 421,041
Int. Cl.³ B01J 21/04, 35/02
U.S. Cl. 252—62.55 5 Claims

1. As a composition of matter, a particulate material which can be oriented within, and formed into a magnetically stabilized fluidized bed to provide high magnetization at a low applied field which comprises particles of geometrically elongate shape which have a major axis at least 1.2 times the length of the minor axis, the particles being of average diameter (minor axis) ranging from about 10 μm to about 4000 μm and contain a nonferromagnetic component, composited with a plurality of elongate ferromagnetic components, the ferromag-

netic components being multidomain, having dimensions of at least 1 μm in all directions, elongated in two directions, and having a length:diameter (L/D) ratio of at least 2 and not more than 313, the nonferromagnetic component being comprised of alumina within which said ferromagnetic components are dispersed as inclusions within the interior of the composite particles, and aligned with the major axis of said particles the ferromagnetic components being oriented with their long dimensions essentially parallel, the ferromagnetic components constituting at least 0.5 percent, but not more than $\pi/2(L/D+1)$, of the total volume of each particle, where L/D is the average ratio of the longest dimension of a ferromagnetic inclsuion relative to the shortest dimension, and, in said magnetically stabilized fluidized bed, the particles can rotate, or turn to line up said ferromagnetic components essentially parallel to the direction of the field, and wherein a catalytically effective amount of a catalytically active metal is dispersed on the surface of the composite, and the composite particles are catalytically active.

4,394,282

COMPOSITION FOR USE IN A MAGNETICALLY FLUIDIZED BED

Robert L. Seiver, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 218,088, Dec. 19, 1980, Pat. No. 4,368,132, which is a continuation-in-part of Ser. No. 943,552, Sep. 18, 1978, abandoned. This application Sep. 22, 1982, Ser. No. 421,046

Int. Cl.³ B01J *21/00, 23/00, 35/02*

U.S. Cl. 252—62.55 **4 Claims**

1. As a composition of matter, particulate material which can be oriented within, and formed into a magnetically stabilized fluidized bed to provide an effective demagnetization coefficient of from about 0.0027 to about 0.174, which comprises particles containing a non-ferromagnetic refractory, porous inorganic oxide component composited with a plurality of elongate ferromagnetic components, each ferromagnetic component being multidomain, having dimensions of at least 1 μm in all directions, elongated in two directions, and having a length:diameter (L/D) ratio of at least 2 but not more than 313, said ferromagnetic components being present in the composite particles as inclusions within a matrix formed by said nonferromagnetic component, and oriented in such a way that there is a preferred direction in each particle such that all the ferromagnetic components in said particle have a long dimension essentially parallel with said preferred direction and constituting at least 0.5%, but not more than $\pi/2(L/D+1)$, of the total volume of each particle, where L/D is the average ratio of the longest dimension of the ferromagnetic components relative to the shortest dimension, and, in said magnetically stabilized fluidized bed, the particles can rotate, or turn to line up said preferred direction parallel to the direction of the field such that essentially all of the ferromagnetic components have a long dimension essentially parallel to the direction of the field, and wherein a catalytically effective amount of a catalytically active metal is dispersed on the surface of the composite particles, and the composite particles are catalytically active.

4,394,283

STABLE ICE RELEASE AGENT

Lorenzo Spratt, P.O. Box 41138, Dallas, Tex. 75241

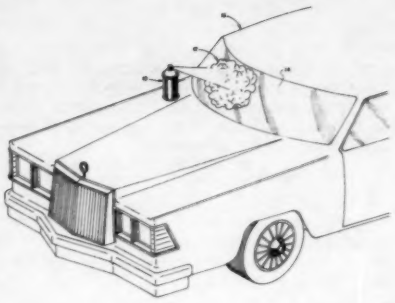
Filed Apr. 20, 1981, Ser. No. 255,524

Int. Cl.³ C09K *3/18*

U.S. Cl. 252—70 **5 Claims**

1. In a pressurized container which is provided with a spray valve, an ice release composition consisting of propylene glycol mixed with propylene glycol monostearate and water and a propellant.

3. A method for inhibiting the bonding of ice precipitates to a substrate comprising the step of applying directly to the substrate a layer of an ice release composition consisting of propylene glycol mixed with propylene glycol monostearate and water wherein said ice release composition is applied to



said substrate from a pressurized sealed container which contains said ice release composition and a propellant.

4,394,284

STABILIZED METHYLCHLOROFORM COMPOSITION

Alvetta Pryor, Houston, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 234,279, Feb. 3, 1981, abandoned, which is a continuation-in-part of Ser. No. 169,864, Jul. 17, 1980, abandoned. This application Aug. 2, 1982, Ser. No. 403,961

Int. Cl.³ C23G *7/52;* **C11D** *5/02*

U.S. Cl. 252—153 **3 Claims**

1. A stabilizer composition for 1,1,1-trichloroethane wherein the stabilizer consists essentially of 1.5 to 4 vol. % dioxane, 0.75 to 2 vol. % butylene oxide and 0.1 to 1.0 vol. % 3-butyn-1-ol based on the total volume of stabilizer and trichloroethane.

3. A stabilized 1,1,1-trichloroethane solvent employed in a vapor degreasing process which consists essentially of 2.0 to 3.0% dioxane, 0.75% butylene oxide, 0.5% 3-butyn-1-ol, 1.5% of ethyl or isopropyl nitrate and the remainder trichloroethane all based on the total volume of solvent plus inhibitors.

4,394,285

PRINS REACTION PRODUCTS OF DIISOAMYLENE, DERIVATIVES THEREOF, ORGANOLEPTIC USES THEREOF AND PROCESSES FOR PREPARING SAME

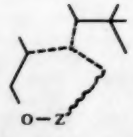
Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 267,850, May 28, 1981, Pat. No. 4,359,412. This application Jun. 24, 1982, Ser. No. 391,575

Int. Cl.³ C11D *3/50, 9/44*

U.S. Cl. 252—174.11 **1 Claim**

1. A process for augmenting or enhancing the aroma of a perfumed article which is a solid or liquid anionic, cationic, nonionic or zwitterionic detergent comprising the step of adding to a solid or liquid anionic, cationic, nonionic or zwitterionic detergent base an aroma augmenting or enhancing quantity of at least one compound defined according to the structure:



wherein one of the dashed lines is a carbon-carbon double bond and each of the other of the dashed lines is a carbon-car-

bon single bond; wherein the wavy line: ~~~ is a carbon-carbon single bond or no bond at all; wherein Z represents hydrogen, $—CH_2—$, or C_2–C_4 acyl; with the proviso that when the wavy line: ~~~ is no bond at all, Z represents hydrogen or C_2–C_4 acyl and when the wavy line: ~~~ is a carbon-carbon single bond, then Z represents $—CH_2—$.

4,394,286

PARTIALLY HYDROLYZED, DMT PROCESS RESIDUE, AND USEFUL PROPYLENE OXIDE DERIVATIVE THEREOF

William H. Millick, III, Wilmington, N.C., assignor to Hercofina, Wilmington, N.C.

Filed May 20, 1981, Ser. No. 265,503

Int. Cl.[3] **C08G** *18/48;* **C09K** *3/00;* **C07C** *69/76;* **C08F** *6/00*

U.S. Cl. 252—182 **9 Claims**

1. As a composition of matter, partially hydrolyzed, DMT process residue, characterized by an Acid No. of about 150–375 mg. KOH/g.

4. As a composition of matter, a mixture of partially hydrolyzed, DMT process residue characterized by an Acid No. of about 150–375 mg. KOH/g, and a glycol containing 4 or more carbon atoms.

8. As a composition of matter, a mixture consisting essentially of the propylene oxide reaction product of partially hydrolyzed, DMT process residue, which residue is characterized by an Acid No. of about 150–375 mg. KOH/g., and dipropylene glycol up to about 20% of the mixture.

4,394,287

INCORPORATION OF FINELY DIVIDED ADDITIVES AT THE SURFACE OF MICROCAPSULE WALLS

Joseph A. Scarpelli, Dayton, Ohio, assignor to Eurand America, Inc., Dayton, Ohio

Filed Apr. 10, 1981, Ser. No. 252,919

Int. Cl.[3] **B01J** *13/02*

U.S. Cl. 64—4.32 **6 Claims**

1. A method for preparing en masse, in an aqueous manufacturing vehicle, microcapsules with a substantially water-insoluble core and containing incorporated at their surface under a thin polymer film a substantially water-insoluble finely divided additive which comprises the steps of:

(a) producing an aqueous suspension of microcapsules containing a substantially water-insoluble core material and having as at least one wall material component an anionic hydrophilic polymeric colloid which produces a solid wall around the core,

(b) then adding substantially water-insoluble finely divided additive under stirring to produce a fine dispersion, and

(c) adding cationic hydrophilic polymeric colloid solution without further addition of anionic hydrophilic colloid to cause the colloid to envelop the additive and deposit it on the capsule wall under a thin film.

4,394,288

ACTIVATED AMMONIUM NITRATE PLASTIC FOAM BLOWING AGENT

Sambasiva R. Allada, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 251,618, Apr. 6, 1981, abandoned. This application Feb. 25, 1982, Ser. No. 351,849

Int. Cl.[3] **C09K** *3/00*

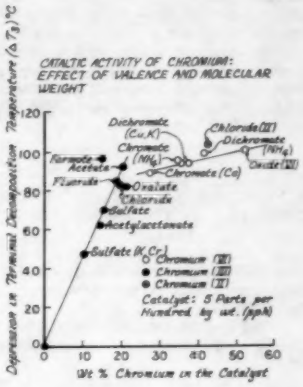
U.S. Cl. 252—350 **4 Claims**

1. A blowing agent system for foaming expandable resinous thermoplastic material masses, comprising an intimate, generally "fluffy" and finely divided powder composition of:

(a) ammonium nitrate; and

(b) up to about 10 parts per hundred by weight, based on total composition weight, of a chromium compound selected from the group consisting of: inorganic and organic salts of chromium; oxides of chromium excepting the crystalline sesquioxide but including amorphous forms thereof; and mixtures of same;

said composition having an average particle size range on the order of between about ¼ and about 50 microns;



(c) up to about 4 percent by weight, based on total composition weight of a surfactant or soap additament.

4,394,289

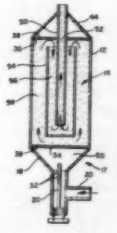
CONTINUOUS FOAM GENERATING SYSTEM

Lamar W. Brown, 1185 Clearview Dr., Ringgold, Ga. 30736, and James E. Bartenfield, 1104 W. Pine Dr., Dalton, Ga. 30720

Filed Jul. 1, 1981, Ser. No. 279,336

Int. Cl.[3] **B01F** *3/04, 5/06*

U.S. Cl. 252—359 E **3 Claims**



1. Apparatus for producing foam continuously, said apparatus comprising:

a body member defining a foam generating chamber, said body member having an inlet in communication with said foam generating chamber and an outlet in communication with said foam generating chamber at a point remote from said inlet, said inlet and outlet being in an imaginary substantially non-horizontal plane;

means for introducing a foamable liquid into said inlet;

means for introducing a gas into said inlet simultaneously with said foamable liquid;

turbulator means substantially filling said foam generating chamber for foaming, mixing and homogenizing said foamable liquid and gas;

first baffle means disposed within said body member and extending from said outlet toward said inlet, said first baffle means defining a first zone within said foam generating chamber;

second baffle means disposed within said body member and disposed about said first baffle means, said second baffle

means defining a second zone within said foam generating chamber between said first baffle means and said second baffle means;

said body member defining a third zone within said foam generating chamber between said body member and said second baffle means;

said third zone communicating with said inlet and with said second zone at one end of said second baffle means; and

said second zone communicating with said first zone at the other end of said second baffle means, said second zone not being communicable with said third zone at said other end of said second baffle means and said first zone communicating with said outlet.

4,394,290

REGENERATION OF SUPPORTED CATALYSTS CONTAINING PALLADIUM AND/OR PLATINUM AND TELLURIUM

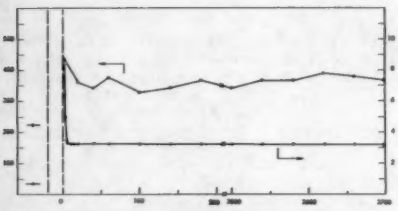
Rolf Schnabel, Schifferstadt; Hans-Martin Weitz, Bad Durkheim, and Rolf Fischer, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 29, 1981, Ser. No. 335,503

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1981, 3102087

Int. Cl.³ B01J *23/96;* **C07C** *69/16, 67/055*

U.S. Cl. 252—412 **10 Claims**



1. A process for regenerating a supported catalyst for acyloxylations, which catalyst contains palladium or platinum or mixtures thereof as well as tellurium, with or without copper, the copper content A being from 0 to 2, where A is the number of gram atoms of copper per gram atom of the palladium or platinum or mixtures thereof, which process comprises:

impregnating the catalyst to be regenerated with a copper solution in such an amount that the regenerated catalyst has a copper content $B=A+C$, where A has the above meaning and C is a number from 0.5 to 6;

drying the impregnated catalyst at from 50° to 200° C.;

then treating the catalyst with a reducing agent at from 100° to 500° C.; and

finally heating the catalyst at from 400° to 900° C.

9. A process as claimed in claim **1**, wherein the reducing agent is selected from the group consisting of hydrogen, hydrazine, methanol and formaldehyde.

10. A process as claimed in claim **1**, wherein the final heating step at 400°–900° C. is carried out for a period of about 15 minutes to 4 hours.

4,394,291

POLYOLEFIN POLYMERIZATION PROCESS AND CATALYST

Gil R. Hawley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 4, 1981, Ser. No. 240,533

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **35 Claims**

1. A catalyst for the polymerization of alpha olefins comprising the product resulting when reactants comprising

(a) a metal dihalide wherein the metal is selected from Groups IIA and IIB of the Periodic Table, and

(b) a transition metal compound wherein the transition metal is selected from the group consisting of Groups IVB and VB transition metals and the transition metal is bonded to at least one atom selected from the group consisting of oxygen, nitrogen, and sulfur, and said oxygen, nitrogen, and sulfur atoms are in turn bonded to a carbon atom of an organic radical are (1) reacted to produce a first catalyst component, and (2) said first catalyst component is reacted with at least one organoaluminum precipitating agent selected from compounds of the general formula AlR_nX_{3-n} wherein each R is individually selected from saturated and unsaturated hydrocarbyl radicals containing 1 to 20 carbon atoms per radical, X is a halogen, and n is any number such that $1 \leqq n \leqq 2$, and then (3) the product of that reaction is reacted with at least one halogen-containing compound of Groups IVA and VA capable of adding halogen to the product of step (c).

4,394,292

CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Yasuharu Yamada, Osaka, and Kiyoshi Kawai, Toyonaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 138,148, Apr. 7, 1980, Pat. No. 4,347,157. This application Feb. 23, 1982, Ser. No. 351,451

Claims priority, application Japan, Apr. 25, 1979, 54-51641; Jan. 28, 1980, 55-9200

Int. Cl.³ C08F *4/02, 4/64*

U.S. Cl. 252—429 B **22 Claims**

1. A solid catalyst component for olefin polymerization prepared by a method consisting essentially of reacting an organo-magnesium compound represented by the formula,

$$R^5MgX \text{ or } R^6{}_2Mg$$

wherein R^5 and R^6 are each an alkyl, aryl, aralkyl or alkenyl group having 1 to 20 carbon atoms, and X is a chlorine, bromine or iodine atom, in solution, with an alkoxy phosphorus compound of the formula,

$$R^3{}_dP(OR^4)_eX_f$$

wherein R^3 and R^4 are each a hydrocarbon group having 1 to 20 carbon atoms, X is a halogen atom, and d, e, and f are numbers satisfying the equations at the same time,

$$0 \leqq d < e,\ 0 < e \leqq 3,\ 0 \leqq f < 3, \text{ and } d+e+f=3$$

to produce a solid product which is a catalyst carrier, and supporting a titanium compound and/or a vanadium compound on said solid product.

4,394,293

CATALYST FOR THE PHOTOLYTIC PRODUCTION OF HYDROGEN FROM WATER

Michael Gratzel, and John Kiwi, both of Vaud, Switzerland, assignors to Engelhard Corporation, Iselin, N.J.

Filed Sep. 5, 1980, Ser. No. 184,673

Claims priority, application United Kingdom, Sep. 8, 1979, 7931250; Switzerland, Jul. 8, 1980, 8022338

Int. Cl.³ B01J *31/02;* **C08K** *3/08*

U.S. Cl. 252—430 **12 Claims**

1. A stabilized catalyst for promoting electron transfer to water protons for mediating evolution of hydrogen gas by photolysis comprising an active catalytic reducing amount of Noble metal particles in finely divided form and a water permeable protective agent adsorptive to said metal particles and being polyvinyl alcohol.

4,394,294

MEMBRANE CATALYST FOR HYDROGENATION OF ORGANIC COMPOUNDS AND METHOD FOR PREPARING SAME

Vladimir M. Gryaznov, Lomonosovsky prospekt 14, kv. 504; Viktor S. Smirnov, Kutuzovsky prospekt 26, kv. 555; Valentin M. Vdovin, Leninsky prospekt 23, kv. 90; Margarita M. Ermilova, ulitsa Cherkizovskaya 10, korpus 2, kv. 103, all of Moscow; Liya D. Gogua, ulitsa Arakishvili, 7, kv. 7, Tbilisi; Nina A. Pritula, ulitsa 3-ya Frunzenskaya, 14, kv. 87, and Galina K. Fedorova, ulitsa Pyatnitskaya, 39, kv. 6, both of Moscow, all of U.S.S.R.

Filed Jan. 7, 1981, Ser. No. 223,074

Claims priority, application U.S.S.R., Jan. 20, 1977, 2451417

Int. Cl.³ B01J *31/08, 31/06*

U.S. Cl. 252—430 **11 Claims**

1. A membrane catalyst for hydrogenation of organic compounds comprising a porous metal substrate selected from the group consisting of porous stainless steel, porous copper and porous nickel, having thereon a vulcanized film comprising a polyorganosiloxane polymer and a heterogenized palladium complex of the formula

wherein

R=alkyl, alkoxy or chlorine

R′=—C_6H_4— or —$(CH_2)_n$— and n=1-10

D=PR''_2 wherein R″=alkyl or phenyl; N R'''_2 wherein R‴=alkyl or C_5H_4N

L=—CL, Br or $OCOCH_3$.

4,394,295

COORDINATION COMPLEXES AS POLYESTERIFICATION CATALYSTS

Kurt Weinberg, Upper Saddle River, N.J., and Gordon C. Johnson, Armonk, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 31, 1981, Ser. No. 336,293

Int. Cl.³ C08L *67/02*

U.S. Cl. 252—431 C **17 Claims**

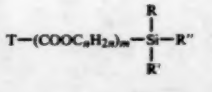
1. A polyesterification catalyst for the manufacture of solid fiber-forming polyesters or copolyester of dicarboxylic acid compounds and aliphatic glycols comprising a coordination complex of (A) and (B), wherein:

(A) is a metal alkoxy halide selected from the group consisting of

$$M(OR)_aX_b$$

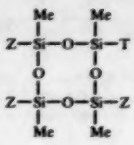
wherein m is at least one of titanium, zinc, germanium, tin, lead, antimony and; R is alkyl, aryl, alkylaryl, arylalkyl, haloalkyl having from 1 to 20 carbon atoms; a and b are integers having a value of from 1 to 3; the sum of (a+b) is equal to or less than the integer 4; x is at least one of F, Cl, Br or I; with the proviso that when M is antimony a is an integer having a value of from 1 to 4 and the sum (a+b) is equal to or less than 5;

(B) is a silicon compound selected from the group consisting of:

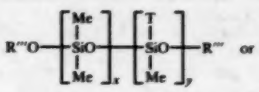


(I)

-continued



(II)



(III)

(IV)

wherein T is $CH_2{=}CX-$ or $(R^*O)_2PCH_2CHX-$;

X is hydrogen or methyl and is methyl only when m is one;

R* is alkyl or haloalkyl having from 1 to 4 carbon atoms;

R** is methyl, ethyl, butyl, acetoxy, methoxy, ethoxy or butoxy;

R is methyl, ethyl, butyl, methoxy, ethoxy, butoxy, or trimethylsiloxy;

R′ is methyl, methoxy, ethoxy, butoxy or trimethylsiloxy;

R″ is methoxy, ethoxy, butoxy, trimethylsiloxy or vinyldimethylsiloxy;

R‴ is methyl, ethyl, butyl or trimethylsilyl;

Me is methyl;

Z is methyl or T;

Q is an $NCCH_2$—, $NH_2CH_2NHCH_2$—, NC—HS— or $HSCH_2CH_2S$— group;

n is an integer having a value of from 2 to 5;

m is an integer having a value of zero or one;

x is an integer having a value of from 1 to 100; and

y is an integer having a value of from 1 to 100;

wherein the mole ratio of A:B in said coordination complex is from 2:1 to 1:10.

4,394,296

BORON TRIFLUORIDE-WATER-SILICA CATALYST

Ajay M. Madgavkar, Irvine, Calif., and Harold E. Swift, Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 104,415, Dec. 17, 1979, Pat. No. 4,308,414. This application Aug. 3, 1981, Ser. No. 289,456

Int. Cl.³ B01J *21/02, 37/00*

U.S. Cl. 252—433 **7 Claims**

1. A three-component hydrocarbon conversion catalyst comprising particulate silica having boron trifluoride and water adsorbed thereon, said catalyst obtainable by the adsorption on said particulate silica of water and boron trifluoride from a liquid hydrocarbon in the presence of an atmosphere comprising boron trifluoride.

4,394,297

ZINC TITANATE CATALYST

John H. Kolts, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 267,230, May 26, 1981, Pat. No. 4,368,344. This application Sep. 30, 1982, Ser. No. 430,628

Int. Cl.³ B01J *27/14, 23/08;* **H01B** *1/06*

U.S. Cl. 252—437 **6 Claims**

1. A catalyst composition comprising zinc, titanium and a promoter at least one member of which is selected from the group consisting of aluminum, phosphorus, indium, and tin wherein said zinc and titanium are present in said catalyst composition in the form of zinc titanate which is prepared by calcining a mixture of zinc oxide and titanium dioxide in the

presence of free oxygen at a temperature in the range of about 650° C. to about 1050° C.

4,394,298

HYDROGENATION CATALYST

Gerhard P. Nowack; Marvin M. Johnson, and Donald C. Tabler, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 111,053, Jan. 10, 1980, abandoned. This application Aug. 3, 1981, Ser. No. 289,350

Int. Cl.³ B01J *23/46, 23/74, 27/24*

U.S. Cl. 252—438 **1 Claim**

1. A hydrogenation catalyst comprising a suitable support and ruthenium (III) hexacyanocobaltate.

4,394,299

PALLADIUM-RHODIUM CATALYST FOR PURIFICATION OF CRUDE TEREPHTHALIC ACID

Imre Puskas, Glen Ellyn, and David E. James, Batavia, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 29, 1981, Ser. No. 316,338

Int. Cl.³ B01J *23/46, 23/44;* **C07C** *51/42*

U.S. Cl. 252—447 **22 Claims**

11. A catalyst composition for purification of terephthalic acid which comprises crystallites of palladium and rhodium adsorbed on a porous activated carbon support material, said support material having a surface area of at least 600 m^2 /g wherein said catalyst composition is prepared by contacting said support with (a) an aqueous solution of an amine and a palladium salt in the presence of an organic carboxylic acid wherein concentration of said amine is sufficient to solubilize said palladium salt and mole ratio of said acid to said amine is at least 0.75 and with (b) an aqueous solution of a rhodium compound and an alkali metal nitrite wherein penetration of said palladium and rhodium crystallites into said porous support is within the range of from about 70 to 150 micrometers of the surface of said support.

12. The composition of claim 11 wherein said amine is selected from the group consisting of ammonia, pyridine, the picolines and the lutidines.

14. The composition of claim 11 wherein said acid has from 2 to 5 carbon atoms and is selected from the group consisting of acetic acid, propionic acid, butyric acid, isobutyric acid, n-valeric acid and mixtures thereof.

4,394,300

ZEOLITE CATALYST MODIFIED WITH GROUP IVB METAL

Chin C. Chu, North Brunswick, and Warren W. Kaeding, Westfield, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 137,881, Apr. 7, 1980, Pat. No. 4,278,827. This application Nov. 14, 1980, Ser. No. 206,820

Int. Cl.³ B01J *29/28*

U.S. Cl. 252—455 Z **11 Claims**

1. A catalyst composition comprising:

a crystalline zeolite material characterized by a constraint index of within the approximate range of 1 to 12 and a silica to alumina mole ratio of at least 12;

said zeolite further comprising at least 0.25 weight percent of one or more Group IVB metals incorporated into said zeolite in the form of a Group IVB metal oxide and at least 0.25 weight percent of phosphorus incorporated into said zeolite in the form of an oxide of phosphorus.

2. The composition of claim 1 wherein said Group IVB metal is germanium.

4. The composition of claim 1 wherein said Group IVB metal is tin.

6. The composition of claim 1 wherein said Group IVB metal is lead.

4,394,301

CATALYTIC HYDROCRACKING, HYDRODESULFURIZATION, AND/OR HYDRODENITROGENATION OF ORGANIC COMPOUNDS EMPLOYING PROMOTED ZINC TITANATE AND A ZEOLITE AS THE CATALYTIC AGENT

Lloyd E. Gardner, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 145,639, May 1, 1980, Pat. No. 4,324,647. This application Jan. 18, 1982, Ser. No. 340,148

Int. Cl.³ B01J *29/10, 29/16*

U.S. Cl. 252—455 Z **14 Claims**

1. A catalyst composition comprising zeolite, zinc, titanium, and at least one promoter selected from the group consisting of vanadium, chromium, cobalt, nickel, molybdenum, tungsten, rhenium, platinum, palladium, rhodium, ruthenium, and compounds thereof.

4,394,302

HYDRODESULFURIZATION CATALYST ON LITHIUM-CONTAINING SUPPORT AND METHOD FOR ITS PREPARATION

J. Wayne Miller, Yorba Linda, and Howard D. Simpson, Irvine, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Oct. 26, 1981, Ser. No. 314,526

Int. Cl.³ B01J *21/04, 23/04, 23/24*

U.S. Cl. 252—465 **34 Claims**

1. A method for preparing a catalyst which method comprises incorporating a porous refractory oxide with a lithium component, calcining the lithium-incorporated porous refractory oxide to form a lithium component-containing composition having a substantially increased average pore diameter than that of said porous refractory oxide and incorporating a Group VIB metal component with said composition.

4,394,303

LARGE PORE SHAPED HYDROPROCESSING CATALYSTS

Kirk R. Gibson, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 12, 1981, Ser. No. 262,856

Int. Cl.³ B01J *23/84, 35/02*

U.S. Cl. 252—470 **4 Claims**

1. A catalyst for hydroprocessing heavy hydrocarbonaceous feedstocks that contain at least 10 ppm nickel plus vanadium comprising:

a porous shaped catalyst particle comprising an elongated extrudate having an asymmetric quadralobe cross-section characterized by having the centers of the four component circles define two substantially equilateral triangles joined on a base, having substantially all of the points within said particle within 0.02 inch from the nearest external surface of said particle, said particle having an average pore diameter within the range of 120 Angstroms to 700 Angstroms, said particle having between 4 and 15 weight percent of a catalytic metal from Group VIB and between 0 and 10 weight percent of a catalytic metal from Group VIII; where said weight percents are based on the catalytic metals content of the total particle weight, calculated as reduced metal, such that when contacted with a heavy hydrocarbonaceous feedstock containing at least 10 ppm nickel plus vanadium under hydroprocessing conditions substantial metal penetration occurs to a depth of at least 0.012 inch from the nearest surface of said support.

4,394,304

ELECTRICALLY CONDUCTING POLYMER BLENDS

Gary E. Wnek, Natick, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 29, 1982, Ser. No. 344,143
Int. Cl.³ C08F 8/22, 255/02, 257/02; H01B 1/12
U.S. Cl. 252—520 11 Claims

1. A method of forming a conductive polymer comprising a blend of at least one processable polymer, polyacetylene and a dopant, the method comprising:

(a) impregnating at least one processable polymer with a Ziegler-Natta catalyst;

(b) exposing said impregnated polymer to acetylene gas, whereby substantially linear molecules of polyacetylene are formed within a matrix of the processable polymer; and

(c) introducing a dopant into the polyacetylene, whereby a conductive blend is formed.

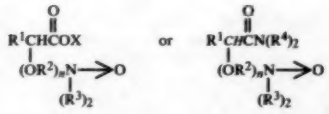
4,394,305

ALPHA-OXYALKYLENE AMINE OXIDE COMPOUNDS USEFUL IN DETERGENTS

Eugene P. Gosselink, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

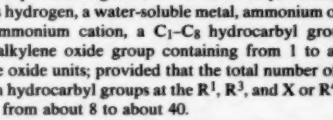
Filed Mar. 17, 1981, Ser. No. 244,533
Int. Cl.³ C11D 3/30, 3/32; C07C 103/127, 69/22
U.S. Cl. 252—528 35 Claims

1. A compound of the formula:



wherein R^1 is hydrogen or a C_1–C_{20} hydrocarbyl group; R^2 is a C_2–C_6 alkylene group; n is from 1 to about 20; each R^3 is a C_1–C_{20} hydrocarbyl group or a C_2–C_3 alkylene oxide group containing from 1 to about 10 alkylene oxide units; each R^4 is hydrogen, a C_1–C_{20} hydrocarbyl group or a C_2–C_3 alkylene oxide group containing from 1 to about 10 alkylene oxide units; and X is hydrogen, a water-soluble metal, ammonium or substituted ammonium cation, a C_1–C_8 hydrocarbyl group or a C_2–C_3 alkylene oxide group containing from 1 to about 10 alkylene oxide units; provided that the total number of carbon atoms in hydrocarbyl groups at the R^1, R^3, and X or R^4 substituents is from about 8 to about 40.

24. A detergent composition comprising from about 0.005% to about 99% by weight of an amine oxide surfactant of the formula:



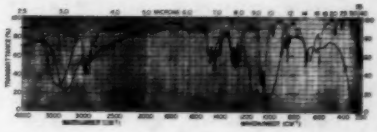
wherein R^1 is hydrogen or a C_1–C_{20} hydrocarbyl group; R^2 is a C_2–C_6 alkylene group; n is from 1 to about 20; each R^3 is a C_1–C_{20} hydrocarbyl group or a C_2–C_3 alkylene oxide group containing from 1 to about 10 alkylene oxide units; each R^4 is hydrogen, a C_1–C_{20} hydrocarbyl group or a C_2–C_3 alkylene oxide group containing from 1 to about 10 alkylene oxide units; and X is hydrogen, a water-soluble metal, ammonium or substituted ammonium cation, a C_1–C_8 hydrocarbyl group or a C_2–C_3 alkylene oxide group containing from 1 to about 10 alkylene oxide units; provided that the total number of carbon atoms in hydrocarbyl groups at the R^1, R^3, and X or R^4 substituents is from about 8 to about 40.

4,394,306

BROMINE CONTAINING FIRE RETARDANT COMPOSITIONS OF MATTER

Manny Ravey, Haifa, Israel, assignor to IMI (Tami) Institute for Research & Development Ltd., Haifa, Israel

Filed Apr. 22, 1981, Ser. No. 256,476
Claims priority, application Israel, May 23, 1980, 60149
Int. Cl.³ C09K 3/28
U.S. Cl. 252—609 15 Claims



1. A composition of matter of the formula

$$(BrCH_2)_m C[CH_2O(CH_2O)_xH]_{4-m}$$

wherein m=1.6 to 2.3 and x=0.75 to 1.10, obtained by the hydroxymethylation 2-bromomethyl-2-hydroxymethyl-propane-1,3-diol, 2,2-bis(bromomethyl)propane-1,3-diol, 2-bromomethyl-2-hydroxymethyl-1,3-dibromopropane, and mixtures thereof, containing an average of 1.7 to 2.5 hydroxyl groups per molecule, with formaldehyde or its polymeric forms, said compositions of matter being useful as active or additive fire retardants for polymeric materials.

11. Fire retardant compositions comprising compounds, according to claim 1, together with phosphorus-containing reactive fire retardant component.

4,394,307

TRACK RECORDING PLASTIC COMPOSITIONS

Gregory Tarle, 2665 Kenney Dr., San Pablo, Calif. 94806

Filed Feb. 18, 1981, Ser. No. 235,691
Int. Cl.³ C08K 5/11
U.S. Cl. 524—776 15 Claims

1. An improved nuclear particle track recording solid plastic composition consisting essentially of about 98% by weight of polymeric di-ethylene glycol bis allyl carbonate and an effective amount to reduce roughening caused by etchants up to about 2% by weight of a alkyl phthalic acid ester admixed therein.

4,394,308

METHOD OF PRODUCING α-L-ASPARTYL-L-PHENYLALANINE METHYLESTERS

Prathivadibhayankaram S. Sampathkumar, Parsippany, and Basant K. Dwivedi, Randolph, both of N.J., assignors to Chimicasa GmbH, Switzerland

Continuation of Ser. No. 150,881, May 27, 1980, abandoned. This application Sep. 25, 1981, Ser. No. 305,693
Int. Cl.³ C07C 103/52
U.S. Cl. 260—112.5 R 4 Claims

1. A method of preparing α-L-aspartyl-L-phenylalanine alkylester in high yield without substantial isomer formation of the alkylester, which method comprises:

(a) reacting L-aspartic acid with an alcohol, to provide an esterified aspartate compound with the beta-carboxyl group blocked by the ester group, and having a free alpha-carboxyl group;

(b) reacting the amino group of the esterified aspartate compound with a carbobenzoxy halide, to provide an N-carbobenzoxyl, esterified, L-aspartate compound with a free alpha-carboxyl group;

(c) reacting the N-carbobenzoxyl, esterified, aspartate compound in a coupling reaction with an alkylester of L-phenylalanine, by reaction of the free amino group of the

L-phenylalanine with the free alpha-carboxyl group of the aspartate compound, to provide a coupled aspartate-phenylalanine compound;

(d) hydrogenating the coupled compound, to reintroduce into the molecule the free amino group and one of the free carboxyl groups of the aspartate portion of the coupled compound; and

(e) recovering the L-aspartyl-L-phenylalanine alkylester in a high yield, without substantial racemization of the α-L-aspartyl-L-phenylalanine alkylester.

4,394,309

PROCESS FOR THE PREPARATION OF N,N-DIMETHYL-N-(2-BROMO-4-METHYLPHENYL)-TRIAZENE

Claus Stölzer, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

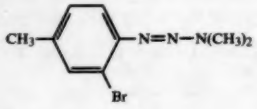
Filed Mar. 30, 1981, Ser. No. 249,247

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1980, 3014122

Int. Cl.[3] **C07C** *113/00, 113/04, 103/27, 87/60*

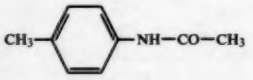
U.S. Cl. 260—140 **9 Claims**

1. A process for the preparation of N,N-dimethyl-N'-(2-bromo-4-methyl-phenyl)-triazene of the formula

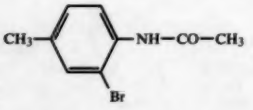


consisting essentially of

(a) reacting N-acetyl-p-toluidine of the formula



with bromine at a temperature between about 0° and 100° C., to give the intermediate product of the formula



(b) reacting the intermediate product with hydrochloric acid by either

(i) adding a dilute solution of aqueous hydrochloric acid to the intermediate product in its reaction solution and heating the mixture to a temperature between about 50° and 120° C., or

(ii) precipitating the intermediate product from its reaction solution by mixing with water and filtering off, and without purification or drying heating the precipitate with dilute aqueous hydrochloric acid to a temperature between about 50° and 120° C., thereby to form a solution of 2-bromo-4-methylaniline hydrochloride,

(c) reacting the resulting aqueous solution with an alkali metal nitrite at a temperature between about −20° and +30° C., and

(d) reacting the product with dimethylamine at a temperature between about 0° and 50° C.

4,394,310

1-AMINO-2-SULFO-(4'-PYRAZOLONYL-PHENYL)-AMINOANTHRAQUINONE COMPOUNDS AND A PROCESS FOR THEIR PREPARATION

Hermann Fuchs, Königstein, and Klaus Filzinger, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

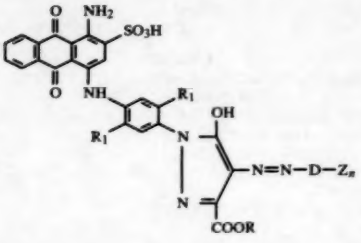
Continuation of Ser. No. 75,534, Sep. 13, 1979, abandoned. This application Oct. 31, 1980, Ser. No. 202,779

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840120

Int. Cl.[3] **C09B** *62/45, 62/503, 62/505;* **D06P** *1/384*

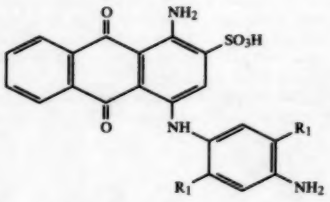
U.S. Cl. 260—162 **5 Claims**

1. A water-soluble anthraquinone-azo compound in the form of a free acid having the formula

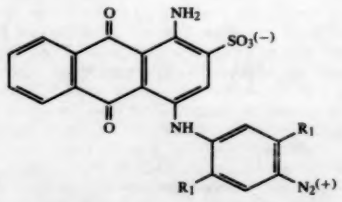


wherein each R_1 is sulfo or when one R_1 is hydrogen the other R_1 is sulfo; R is hydrogen or lower alkyl; D is unsubstituted benzene or unsubstituted naphthalene or benzene or naphthalene which is substituted by 1 to 3 substituents selected from the group consisting of lower alkyl, lower alkoxy, halogen, nitro and sulfo and is substituted by the a fibre-reactive group Z which is the group $—SO_2—CH_2—CH_2—Z_1$ or $—SO_2—CH=CH_2$, in which Z_1 is hydroxy or an inorganic or organic radical which can be eliminated to form $—SO_2—CH=CH_2$ and n is 1 or 2.

4. A process for the preparation of a compound defined in claim 1, which comprises diazotizing a compound of the formula

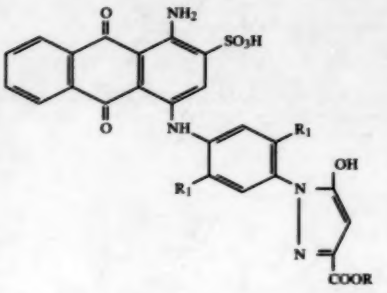


in which R_1 is defined as in claim 1, by means of an equivalent quantity of sodium nitrite, in the presence of a mineral acid, to give the diazo compound of the formula



in which R_1 is defined as in claim 1, and coupling the diazo-

nium salt at a pH in the range of from 3.5 to 5.5 with an acetylsuccinic acid ester of a lower alkanol, adjusting then the pH to a value within the range from 9 to 13 to form the pyrazolone compound of the formula



in which R and R_1 are defined as in claim 1, and coupling this compound with the diazonium compound of an amine of the formula

$$H_2N-D-Z_n$$

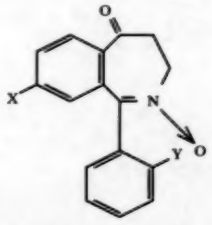
in which D, Z and n are defined as in claim 1.

4,394,311
PRODUCTION OF 2-BENZAZEPINES

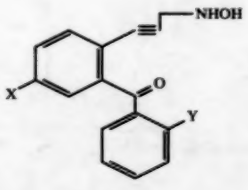
Eugene J. Trybulski, Parsippany, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 150,509, May 16, 1980, Pat. No. 4,318,854, which is a continuation-in-part of Ser. No. 10,118, Feb. 7, 1979, abandoned. This application Nov. 23, 1981, Ser. No. 324,208
Int. Cl.³ C07D *223/16*
U.S. Cl. 260—239 BB **1 Claim**

1. A process to produce a compound of the formula



wherein X and Y are selected from the group consisting of hydrogen, halogen and trifluoromethyl, which consists essentially of the reaction of a compound of the formula



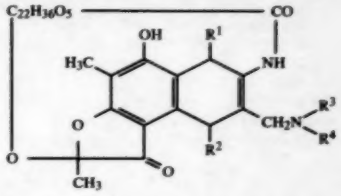
wherein X and Y are as above, with a mixture of a catalytic amount of mercuric sulfate and an excess of a C_1 to C_4 carboxylic acid in an inert solvent at from about −10° C. to room temperature.

4,394,312
PROCESS FOR PREPARING RIFAMYCIN DERIVATIVES

Moon H. Han, and Baik L. Seong, both of Seoul, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Seoul, Rep. of Korea

Filed Apr. 30, 1982, Ser. No. 373,807
Claims priority, application Rep. of Korea, Oct. 15, 1981, 3897/1981[U]
Int. Cl.³ C07D *498/08*
U.S. Cl. 260—239.3 P **4 Claims**

1. A process for preparing 3-dialkylaminomethyl rifamycin S derivatives having the formula:



wherein R^1 and R^2 are oxo (=O); and R^3 and R^4 are methyl, ethyl, propyl, isopropyl, butyl or pentyl, or are connected by methylene bridge where

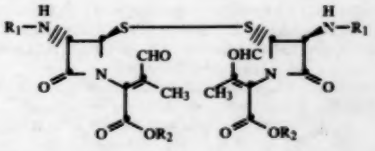
represents piperidine or 3-methylpyrrolidine which process comprises contacting rifamycin S with 1 to 1.5 equimolar amount of an appropriate iminium salt in an organic solvent at a temperature ranging from room temperature to the boiling point of the solvent for a time sufficient to complete the reaction.

4,394,313
SYMMETRICAL AZETIDINONE ALDEHYDE DISULFIDES AND PROCESS

Stjepan Kukolja, Carmel, and Janice L. Pfeil, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

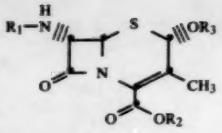
Division of Ser. No. 138,023, Apr. 7, 1980, Pat. No. 4,293,495. This application May 18, 1981, Ser. No. 264,996
Int. Cl.³ C07D *403/12, 487/04, 403/14*
U.S. Cl. 260—245.4 **15 Claims**

1. A process for preparing symmetrical azetidinone aldehyde disulfide compounds of the formula



which comprises:

(1) reacting a 2α-alkoxy cephalosporin ester of the formula



with about 1 to about 1.3 equivalents of an N-chloro halogenating agent in a chlorinated hydrocarbon solvent at a temperature between −10° C. and 30° C.;

(2) combining the above solution with an aqueous suspension of between about 2 and about 4 molar equivalents of mercury dichloride and about 5 to about 7 molar equivalents of cadmium carbonate at a temperature between about 0° C. and about 30° C.; where in the above formulae R_1 is an acyl group of the formula

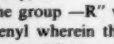
wherein R′ is

(a) C_1–C_7 alkyl, cyanomethyl, C_1–C_6 haloalkyl, 4-protected amino-4-protected carboxybutyl; or

(b) C_1–C_6 alkoxy, phenoxy, benzyloxy or p-methoxybenzyloxy; or

(c) the group —R″ wherein R″ is phenyl or substituted phenyl wherein the substituents are 1 or 2 halogens, protected hydroxy, cyano, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, protected carboxy, protected carboxymethyl, protected hydroxymethyl or protected aminomethyl; or

(d) an arylalkyl group of the formula

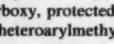


wherein m is 0 or 2; or

(e) a substituted arylalkyl group of the formula

wherein R‴ is R″ as defined above, 2-thienyl, 3-thienyl, 2-furyl or 3-furyl; W is protected hydroxy, protected carboxy, protected amino, or

(f) a heteroarylmethyl group of the formula



wherein R⁗ is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-thiazolyl, 5-tetrazolyl, 1-tetrazolyl;

R_2 is a carboxy protecting group; and R_3 is methyl, ethyl or isopropyl.

4,394,314

PROCESS OF PREPARING AROMATIC ALDEHYDES BY REACTING SELECTED AROMATIC COMPOUNDS WITH FORMAMIDINE ACETATE AND AN ORGANIC ACID ANHYDRIDE

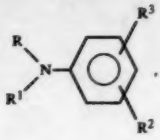
Wallace C. Petersen, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 23, 1981, Ser. No. 256,734

Int. Cl.³ C09B 11/14; C07C 103/24

U.S. Cl. 260—391 **12 Claims**

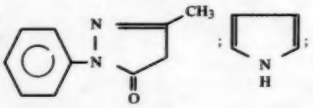
1. A process comprising reacting an aromatic compound Ar, wherein Ar is selected from the group consisting of

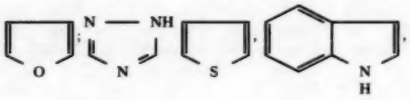


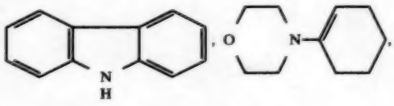
where —R is —CH_3, —C_2H_5, —CH_2CH_2CN, —CH_2CH_2OH, —$CH_2CH_2OCH_3$, —$CH_2CH_2N(CH_3)_2$ or —$CH_2CH{=}CH_2$, —R^1 is —R or

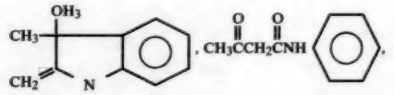
—R^2 is —H, —CH_3 —C_2H_5, —OCH_3, —OC_2H_5, or

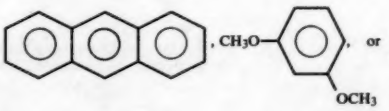
and R^3 is —H, —CH_3, —OCH_3 or —OC_2H_5;

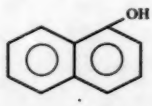






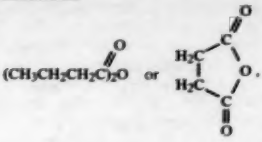




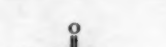


with a compound of the formula $H_2NCH{=}NH^{+}CH_3CO_2^{-}$; and an anhydride of the formula

-continued



to form a compound of the formula



where A is H or F and m is 1, 2, or 3.

4,394,315

METHOD FOR MANUFACTURING P- AND O-BENZOQUINONE DERIVATIVES

Fumio Ishii, Hino, and Kenichi Kishi, Sagamihara, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

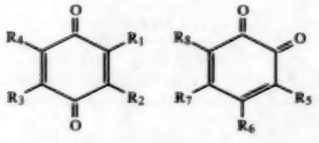
Filed Jan. 28, 1981, Ser. No. 229,061

Claims priority, application Japan, Jan. 31, 1980, 55-10884

Int. Cl.³ C07C *46/06, 50/04, 50/08, 50/12, 50/18*

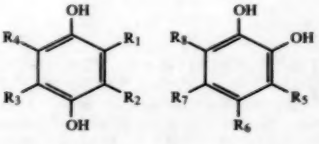
U.S. Cl. 260—396 R **6 Claims**

1. A method for synthesizing p- or o-benzoquinone derivatives represented by formula III or IV



III IV

by oxidizing, at a temperature between −20° C. and 35° C., in the presence of a quaternary ammonium salt phase transfer catalyst, with an aqueous hypohalite solution having a pH of from 8 to 10, a p- or o-hydroquinone derivative represented by formula I or II



I II

wherein, in formula I, II, III, and IV, R_1 through R_8, which may be the same or different, represent hydrogen atoms, or alkyl or aryl groups, provided that all the R_1, R_2, R_3 and R_4 groups and all the R_5, R_6, R_7 and R_8 groups are not hydrogen atoms, and R_1 and R_2, R_3 and R_4, R_5 and R_6, and R_6 and R_7, respectively, may form a 5 or 6-membered hydrocarbon ring, said temperature being between 0° C. and 35° C. when a compound of formula I is oxidized and between −20° C. and 0° C. when a compound of formula II is oxidized.

4,394,316

COPPER MODIFIED MANCOZEB

Yen-Yau H. Chao, North Wales, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 11, 1980, Ser. No. 186,060

Int. Cl.³ C07F *13/00, 1/08*

U.S. Cl. 260—429 K **5 Claims**

1. A copper modified mancozeb which comprises mancozeb reacted with from about 2.5% to about 20% copper (II) ion and a water solubilizing anion or complex thereof.

4,394,317

PLATINUM-STYRENE COMPLEXES WHICH PROMOTE HYDROSILATION REACTIONS

Richard C. McAfee, Tecumseh; James Adkins, Adrian, and Richard L. Miskowski, Jackson, all of Mich., assignors to SWS Silicones Corporation, Adrian, Mich.

Filed Feb. 2, 1981, Ser. No. 230,462

Int. Cl.³ C07F *15/00*

U.S. Cl. 260—429 R **6 Claims**

1. A process for preparing a platinum catalyst for hydrosilation reactions which comprises reacting a platinum halide with an olefinic hydrocarbon selected from the group consisting of styrene and ring substituted styrenes in the presence of a basic material for sufficient time to form a platinum complex having more than one but less than 4 gram atoms of halogen per gram atom of platinum.

4,394,318

TELLURIUM (II) COMPOUNDS AND COMPLEXES HAVING ORGANIC MOIETIES CONTAINING SILICON

Henry J. Gysling, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 198,690, Oct. 20, 1980, Pat. No. 4,287,354. This application Apr. 29, 1981, Ser. No. 258,839

Int. Cl.³ C07F *1/08, 15/00, 1/10, 13/00*

U.S. Cl. 260—429 R **7 Claims**

1. A transition metal complex of a compound represented by the formula:

wherein:

n is an integer from 1 to 10 and

R, R′ and R″ are independently selected from the group consisting of alkyl and aryl.

4,394,319

CO-ORDINATION COMPOUND OF PLATINUM

Paul C. Hydes, and Derek R. Hepburn, both of Reading, England, assignors to Johnson Matthey Public Limited Company, London, England

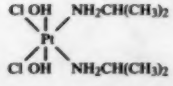
Filed Aug. 26, 1981, Ser. No. 296,478

Claims priority, application United Kingdom, Sep. 3, 1980, 8028484; May 20, 1981, 8115549

Int. Cl.³ C07F *15/00*

U.S. Cl. 260—429 R **3 Claims**

1. A process for the preparation of a co-ordination compound of platinum in substantially pure form and having the structure



comprising reacting cis-dichloro-di(isopropylamine)platinum-(II) with hydrogen peroxide, isolating the product, dissolving the said product in N,N-dimethylacetamide, isolating the resulting product which comprises a 1:1 adduct of the said compound with N,N-dimethylacetamide and thereafter removing

the said N,N-dimethylacetamide under vacuum at a temperature less than 80° C.

4,394,320

SYNTHESIS OF STANNIC TETRA MERCAPTIDES

Michel Pereyre, Talence, and Jean-Claude Pommier, Gradignan, both of France, assignors to Societe Nationale Elf Aquitaine, France

Filed Mar. 10, 1982, Ser. No. 356,820
Claims priority, application France, Mar. 12, 1981, 81 04965
Int. Cl.³ C07F 7/22
U.S. Cl. 260—429.7 **11 Claims**

1. Process of preparation of stannic tetra mercaptides from corresponding mercaptans comprising the step of heating the mercaptan with metallic tin.

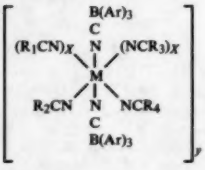
4,394,321

TRIARYLBORANEISOCY ANO METAL COMPOUNDS

Michael M. Cone, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 12, 1981, Ser. No. 320,216
Int. Cl.³ C07F 15/04, 5/02
U.S. Cl. 260—439 R **10 Claims**

1. Compounds having the general formula:



wherein X is 0 or 1, Y is a positive integer of 1–50, M is a metal selected from the group of metals of groups IIA, IB, IIB, VIIB and VIII; provided that when M is Pd, Ag, Cd, Pt, Au or Hg, X is 0; Ar is an aryl or substituted aryl group having 6–10 carbon atoms; R_1, R_2, R_3 and R_4 are the same or different and are selected from groups consisting of alkyl and substituted alkyl groups having 1–6 carbon atoms, alkenyl and substituted alkenyl groups having 2–6 carbon atoms, aryl groups having 6–10 carbon atoms and when adjacent nitrile groups are co-joined alkylene groups having 1–4 carbon atoms.

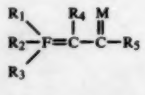
4,394,322

GROUP VA YLIDES AND PROCESS FOR PREPARING SAME

David L. Beach, Gibsonia, and James J. Harrison, Glenshaw, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 179,079, Aug. 18, 1980, Pat. No. 4,293,502, and a continuation of Ser. No. 179,080, Aug. 18, 1980, and a continuation of Ser. No. 179,076, Aug. 18, 1980, Pat. No. 4,293,727, and a continuation of Ser. No. 179,005, Aug. 18, 1980, Pat. No. 4,310,716. This application Nov. 25, 1980, Ser. No. 210,283
Int. Cl.³ C07F 9/72, 9/74, 9/90, 9/50
U.S. Cl. 260—440 **25 Claims**

1. A Group VA ylide defined by the following formula:



wherein R_1, R_2, R_3, R_4 and R_5 are either alike or different members selected from the group consisting of hydrogen, alkyl radicals having from about one to about 24 carbon atoms, aryl radicals having from about six to about 20 carbon atoms, alkenyl radicals having from about two to about 30 carbon atoms, cycloalkyl radicals having from about three to about 40 carbon atoms, aralkyl and alkaryl radicals having from about six to about 40 carbon atoms, hydrocarbyl groups carrying halogen, hydroxyl, alkoxy or aryloxy, or an alkyl, aryl, alkenyl, cycloalkyl, aralkyl or alkaryl group carrying a sulfonato group, provided that at least one of R_1, R_2 and R_3 is an alkyl, aryl, alkenyl, cycloalkyl, alkaryl or aralkyl carrying a sulfonato group; M is sulfur or oxygen; F is phosphorus, arsenic or antimony; and further provided that F is bonded to the groups R_1, R_2 and R_3 through carbon.

4,394,323

PRODUCTION OF ANTIMONY ORGANOPHOSPHORODITHIOATES

Richard E. Lowery, Bartlesville, Okla.; Bruce W. Gordon, and Barry N. Steger, both of Borger, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 1, 1981, Ser. No. 250,964
Int. Cl.³ C07F 9/90
U.S. Cl. 260—446 **4 Claims**

1. A process of reacting one or more antimony reagents of the general formula Sb_mX_n; wherein X is —O, —OH, —OOCR″, —Cl, —Br, or —F; R″ is an organic radical containing 1 to 12 carbon atoms; and m and n are independent and represent numbers from 1 to 5, with at least one hydrocarbyl phosphorodithioic acid component to produce antimony dihydrocarbylphosphorodithioates comprising the steps of

(a) adding less than the stoichiometric amount of antimony reagent to the acid component,

(b) allowing the added antimony reagent to react with the acid component,

(c) repeating steps (a) and (b) until substantially all of the acid component is neutralized, and (d) separating the desired antimony salt from the product of step (c).

4,394,324

STABLE ANTIMONY ORGANOPHOSPHORODITHIOATES

Harold W. Mark; Brent J. Bertus, and John S. Roberts, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1981, Ser. No. 264,526
Int. Cl.³ C07F 9/90
U.S. Cl. 260—446 **9 Claims**

1. Stabilized antimony hydrocarbylphosphorodithioate salts produced by the steps of:

(1) reacting a molar excess of a hydroxyl component with one or more substances containing phosphorus and sulfur, and

(2) reacting the product of step (1) with an antimony-containing compound.

4,394,325

ELEMENTAL SULFUR-STABLIZED ORGANIC ANTIMONY COMPOUND COMPOSITION

Robert E. Bresser, Sharonville, Ohio; Sidney S. White, Jr., Seminole, Fla., and Arthur F. Koeniger, Cincinnati, Ohio, assignors to Carstab Corporation, Reading, Ohio

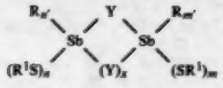
Filed Nov. 27, 1981, Ser. No. 325,473
Int. Cl.³ C09K 15/32; C07C 149/00
U.S. Cl. 260—446 **3 Claims**

1. A composition comprising

A. at least one organic antimony compound containing at least one antimony to sulfur to carbon linkage and being selected from compounds having the formulas:

(I)

or the formula

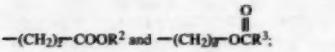


(II)

wherein

R is selected from the group consisting of alkyl, aryl, cycloalkyl, cycloalkenyl, aralkyl, alkaryl, and alkenyl;

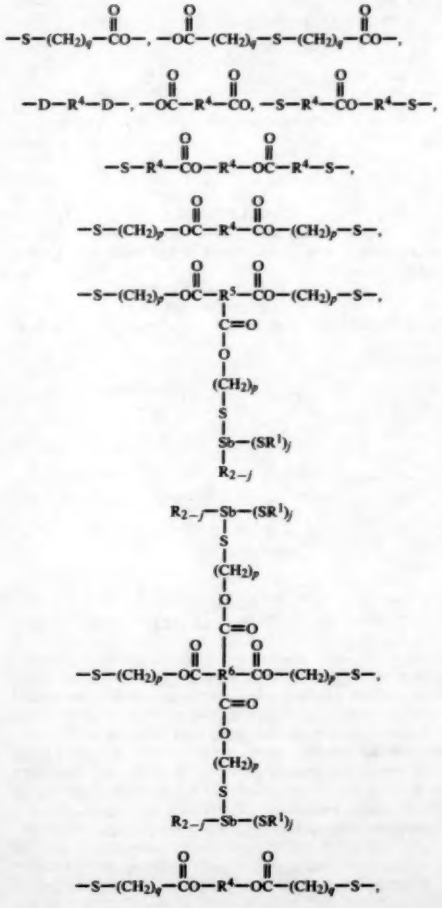
R^1 is selected from the group consisting of alkyl, aryl, cycloalkyl, cycloalkenyl, aralkyl, alkaryl, alkenyl,



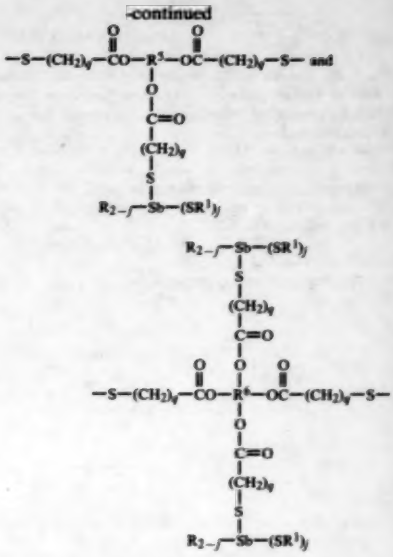
R^2 is hydrogen, alkyl, aryl, alkenyl, cycloalkyl or alkoxyalkyl;

R^3 is alkyl, aryl, cycloalkyl or alkenyl;

Y is selected from the group consisting of



-continued



R^4 is alkylene, arylene or alkenylene;

R^5 is a trivalent alkyl or aryl radical;

R^6 is a tetravalent alkyl or aryl radical;

D is oxygen or sulfur;

i=1, 2 or 3;

j=1 or 2;

m=1 or 2 and m'=0 or 1;

n=1 or 2 and n'=0 or 1;

x is 0 or 1 with the proviso that when x=0 then m+m'=2 and n+n'=2, and when x=1 then m=1, m'=0, n=1 and n'=0;

z is 1, 2 or 3;

a is 2, 3 or 4;

q is 1, 2 or 3; and

p is 2, 3 or 4;

B. elemental sulfur in an amount from about 0.005% to about 2.0% by weight based on the weight of the organic antimony compound.

4,394,326

PREPARATION OF ALKENOXY ALUMINUM COMPOUNDS AND COMPOUNDS PRODUCED

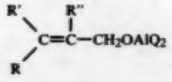
Dennis B. Malpass, La Porte, and G. Scott Yeargin, Pasadena, both of Tex., assignors to Texas Alkyls, Inc., Westport, Conn.

Division of Ser. No. 6,323, Jan. 25, 1979, Pat. No. 4,341,910. This application Mar. 22, 1982, Ser. No. 360,512

Int. Cl.³ C07F 5/06

U.S. Cl. 260—448 AD **2 Claims**

1. A compound having the formula



in which R, R' and R'' are independently alkyl groups having from 1 to 20 carbon atoms each and Q is an alkyl group having from 1 to 20 carbon atoms.

4,394,327

HERBICIDALLY ACTIVE PHENOXY-α-PHENOXY-ALKANECARBOXYLIC ACID DERIVATIVES

Otto Rohr, Therwil, Switzerland; Georg Pissiotas, Lörrach, Fed. Rep. of Germany; Beat Böhner, Binningen, and Kurt Burdeska, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

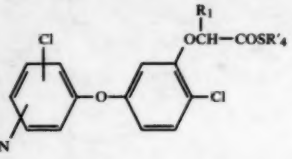
Division of Ser. No. 83,906, Oct. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 883,021, Mar. 3, 1978, abandoned. This application May 14, 1981, Ser. No. 263,650

Claims priority, application Switzerland, Mar. 8, 1977, 2867/77; Jul. 4, 1977, 8182/77

Int. Cl.³ C07C *153/07, 121/75;* **A01N** *41/00*

U.S. Cl. 260—455 R **4 Claims**

1. A compound of the formula



wherein

the floating substituents Cl and CN are in the 2- and 4-positions,

R_1 is hydrogen or C_1–C_4 alkyl, and

R_4' is C_1–C_8 alkyl unsubstituted or substituted by halogen or cyano or interrupted by oxygen, sulfur, a carbonyl or a carboxyl oxy group; C_2–C_8 alkenyl optionally substituted by halogen; C_2–C_8 alkinyl optionally substituted by halogen; C_3–C_8 cycloalkyl; C_3–C_8 cycloalkenyl; phenyl unsubstituted or substituted by halogen, cyano, nitro, C_2–C_4 alkyl, C_1–C_4 alkoxy or trifluoromethyl; or benzyl unsubstituted or substituted by halogen, cyano, nitro, C_1–C_4 alkyl, C_1–C_4 alkoxy or trifluoromethyl.

4,394,328

PRODUCTION OF PEROXYDICARBONATES

James A. Barter, Akron, and David E. Kellar, Barberton, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 920,886, Jun. 30, 1978, abandoned. This application Mar. 27, 1980, Ser. No. 134,370

Int. Cl.³ C07C *68/02*

U.S. Cl. 260—463 **7 Claims**

1. In a process for preparing peroxydicarbonate represented by the formula R—OCO—OO—OCO—R wherein R is an alkyl or cycloalkyl radical derived from a monohydric alcohol and containing up to 18 carbon atoms by reacting, at a temperature of from −10° C. to 30° C., a chloroformate of the formula R—OCO—Cl, wherein R is as defined above, with hydrogen peroxide and alkali metal hydroxide and recovering undiluted peroxydicarbonate from the reaction mixture, wherein the improvement resides in adding aqueous alkali metal hydroxide solution, containing from 20 percent to 40 percent by weight alkali metal hydroxide, to a continuously stirred batch of an aqueous unemulsified, non-colloidal mixture consisting essentially of chloroformate and hydrogen peroxide the mixture containing from 4 to 12 percent stoichiometric excess of hydrogen peroxide based on the quantity of chloroformate and having a hydrogen peroxide content of from about 10 percent to about 35 percent by weight based on the quantity of water in the mixture, sufficient alkali metal hydroxide solution being added to the mixture so as to provide from 1 to 10 percent stoichiometric excess of alkali metal hydroxide based on the quantity of chloroformate in the mixture.

4,394,329

2-HYDROXYMETHYL-1,3-PROPANEDIOL NITRATE ESTER

Michael W. Barnes, Brigham City, Utah, assignor to Thiokol Corporation, Chicago, Ill.

Division of Ser. No. 52,155, Jun. 26, 1979, abandoned, which is a division of Ser. No. 854,946, Nov. 25, 1977, abandoned. This application Oct. 8, 1980, Ser. No. 195,273

Int. Cl.³ C07C *77/02;* **C06B** *45/10, 25/00*

U.S. Cl. 260—467 **4 Claims**

1. A compound 2-hydroxymethyl-1,3-propanediol trinitrate, said compound being a water white liquid at room temperature.

4,394,330

PHOSPHONATE DERIVATIVES OF POLYALKYLENE POLYAMINES AS FLAME RETARDANTS

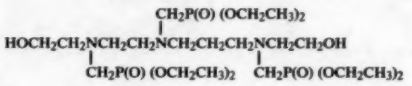
Thomas A. Hardy, Tarrytown, N.Y., and Sophia Y. Liu, Freemont, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 959,390, Nov. 9, 1978, abandoned, which is a continuation of Ser. No. 755,278, Dec. 29, 1976, abandoned. This application Feb. 28, 1980, Ser. No. 125,591

Int. Cl.³ C07F *9/40;* **C08G** *18/00*

U.S. Cl. 260—932 **1 Claim**

1. A composition having the structural formula:



4,394,331

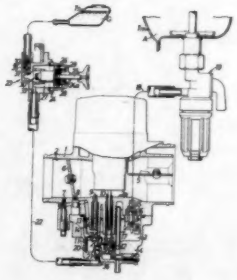
CARBURETOR

Yousuke Okabe, Niiza, and Osamu Shoji, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1981, Ser. No. 238,632

Int. Cl.³ F02M *1/16*

U.S. Cl. 261—18 B **1 Claim**



1. In a carburetor including an intake bore having a venturi portion therein, a throttle valve disposed in said intake bore at the downstream side of said venturi portion, a primary nozzle opening to a portion of said intake bore between said throttle valve and said venturi portion, and a secondary nozzle opening to said venturi portion, said primary nozzle and said secondary nozzle being in communication with a float chamber through a primary jet and a secondary jet, respectively;

an improvement which comprises: a slow fuel passage shunting from a portion between said primary nozzle and said primary jet, said slow fuel passage being communicated with an idle port and a by-pass port both of which open to said intake bore in the vicinity of said throttle valve; a

cup-shaped member disposed beneath the level of the fuel in said float chamber and defining therein a downwardly opened space, said primary jet opening to an uppermost portion of the space in said cup-shaped member while said secondary jet opening to an intermediate portion of the space in said cup-shaped member, a main fuel tank storing an alcoholic fuel therein and communicating with said float chamber through a float chamber; and an auxiliary fuel tank storing gasoline therein and communicating with the space in said cup-shaped member through a metering pump.

4,394,332

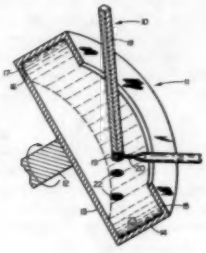
CRUCIBLELESS PREPARATION OF RAPIDLY SOLIDIFIED FINE PARTICULATES

Ramaswamy V. Raman, and Robert S. Carbonara, both of Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Continuation of Ser. No. 163,907, Jun. 27, 1980, abandoned. This application Oct. 29, 1981, Ser. No. 316,003

Int. Cl.³ B01J *2/06*

U.S. Cl. 264—8 **10 Claims**



1. A method of making solid fine particulates from a normally solid material, which at a temperature within 25 percent of its equilibrium melting point °K has a surface tension in the range of 10 to 2500 dynes/cm. and a viscosity in the range of 0.001 to 1 poise when a molten material, comprising the steps of:

(a) heating an unconfined portion of a mass of the solid material to a molten state so as to permit droplets of molten material to fall therefrom;

(b) providing a moving ring-like mass of a centrifugally disposed rotating liquid quench fluid;

(c) positioning said portion subjected to heating and said moving ring-like mass in relation to each other that the droplets of molten material fall into contact with said moving ring-like mass of the centrifugally disposed rotating liquid quench fluid;

(d) breaking said droplets through said contact into fragments and cooling said fragments into solid fine particulates by said moving ring-like mass of the centrifugally disposed rotating liquid quench fluid; and

(e) subsequently separating the solid fine particulates from the liquid quench fluid.

4,394,333

PROCESS FOR THE PRODUCTION OF BLOW MOLDED ARTICLES ACCOMPANIED WITH THE RECOVERY OF A BLOWING GAS

Hatahiko Fukushima, Katano; Tadahiko Handa, Takarazuka, and Kenji Kodama, Hirakata, all of Japan, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 30, 1981, Ser. No. 259,140

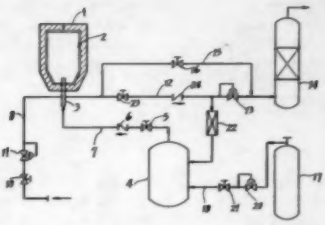
Claims priority, application Japan, May 9, 1980, 55/62086

Int. Cl.³ B29C *17/07, 25/00*

U.S. Cl. 264—37 **14 Claims**

1. In a process for the production of a blow molded thermoplastic article comprising the steps of extruding the thermoplastic material into a molten state to form a parison, introducing from a storage means a blowing gas containing a reactive gas component into the parison and expanding said parison to form the resulting blow molded article, the improvement which comprises:

adjusting within said storage means said blowing gas to a preselected level of pressure and concentration of said reactive gas before introducing the blowing gas into said



parison, purging said blowing gas from the interior of said blow molded article with a purging gas, recovering a mixture of said purging gas and said blowing gas containing a high concentration of the reactive gas component, during an initial stage of said purging, in said storage means and disposing of the remaining mixture of blowing gas and purging gas after the pressure and reactive gas component concentration reaches a preselected level in said storage means.

4,394,334

PROCESS AND APPARATUS FOR DEBURRING MOULDED PARTS PRODUCED BY PRESSING

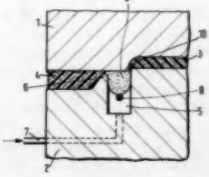
Gunter H. Kiss, Berlin, Fed. Rep. of Germany, assignor to Lignotock Verfahrenstechnik GmbH, Berlin, Fed. Rep. of Germany

Filed Jan. 22, 1982, Ser. No. 341,643

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 3102220

Int. Cl.³ B29J *5/06*

U.S. Cl. 264—80 **12 Claims**



1. A process for deburring moulded parts produced by pressing large edge contours of poor heat-conducting materials formed of crushed, glued, organic, raw materials comprising the steps of:

thermically decomposing the material of a small circumferential zone between the edge contour of the moulded part to be deburred and the waste shoulder during pressing of the moulded part; and

removing the decomposed material from the edge contour when the moulded part is removed from the press tools.

4,394,335
PROCESS FOR PREPARING STRUCTURAL COMPONENTS

Michael Roth, and Volker Frey, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 322,038

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044948

Int. Cl.³ C04B *7/02*

U.S. Cl. 264—82 **9 Claims**

1. A process for preparing structural components which comprises forming a slurry containing a hydraulic bonding agent, water, additives and an organopolysiloxane in which at least a portion of the organopolysiloxane consists of at least one compound of the formula

$$R_xSi(OR')_y(OH)_zO_{\frac{4-x-y-z}{2}}$$

where at least 10 percent of the number of the R radicals are alkyl radicals having at least 4 carbon atoms per radical and the other R radicals are selected from the group consisting of alkyl radicals having from 1 to 3 carbon atoms per radical, phenyl radicals and mixtures thereof, R' is an alkyl radical having from 1 to 4 carbon atoms per radical, x is 0, 1, 2 or 3, with an average of from 0.9 to 1.8, y is 0, 1, 2 or 3, with an average of from 0.01 to 2.0, and z is 0, 1, 2 or 3, with an average 0.00 to 0.5, with the proviso that the sum of x+y+z may not exceed 3.5, molding the slurry and thereafter exposing the molded slurry to aqueous steam.

4,394,336
PRODUCTION OF TABLETS OF SODIUM DICHLOROISOCYANURATE

Tadao Shimamura; Junji Nakano, and Yasufumi Seo, all of Tokushima, Japan, assignors to Shikoku Kasei Kogyo Company Ltd., Marugame, Japan

Filed Jul. 20, 1981, Ser. No. 284,758

Claims priority, application Japan, Aug. 1, 1980, 55-106604

Int. Cl.³ A61J *3/10*

U.S. Cl. 264—109 **5 Claims**

1. A method of producing sodium dichloroisocyanurate tablets capable of gradually and smoothly dissolving in water, comprising tabletting particulate sodium dichloroisocyanurate with a moisture content of from about 7 to about 20 weight %, and thermally treating the resulting tablets at a temperature of from about 50° to about 100° C. under a condition such that the water content in said tablets is not lost by vaporization.

4,394,337
THERMAL INSULATING BODY AND A PROCESS FOR MAKING THE SAME

Hans Kummermehr, Ludwigshafen, Fed. Rep. of Germany, assignor to Grünzweig & Hartmann und Glasfaser AG, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 14, 1980, Ser. No. 196,171

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1979, 2941606; Oct. 18, 1979, 2942087

Int. Cl.³ B29C *1/02, 1/04*

U.S. Cl. 264—122 **13 Claims**

1. A process for making a thermal insulating body, comprising,

forming a first admixture of a binder and a dispersant, wherein the dispersant is present in an amount of 0.5 to 20% by weight of the binder and wherein the particle size of the binder is generally 1 micron or less;

mixing the first admixture with a highly dispersed insulating material to form a second admixture; and

then pressing and curing the second admixture, by application of heat, so that the edges and corners of the insulating material undergo cross-linking with the binder.

4,394,338
PRODUCTION OF ELONGATED FIBER-REINFORCED COMPOSITE ARTICLES

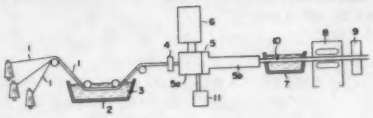
Masaru Fuwa, Abiko, Japan, assignor to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Aug. 10, 1981, Ser. No. 291,812

Claims priority, application Japan, Aug. 21, 1980, 55-114981

Int. Cl.³ B29F *3/10*; B32B *31/12*; B29D *27/00*

U.S. Cl. 264—135 **14 Claims**



1. A pultrusion process for producing elongated composite articles which comprises the steps of: impregnating an elongated reinforcing fiber material with a thermosetting resin; introducing the fiber material impregnated with the thermosetting resin into a stationary long-land die; extruding, into a shaping portion of the long-land die, a non-foaming thermoplastic resin in molten state onto the external surface of the fiber material thereby to coat the entire outer surface of the fiber material with the thermoplastic resin and thereby to form a composite material; immediately thereafter supplying a lubricant between the entire outer surface of the composite material and the inner surface of the long-land die; heating and setting the thermosetting resin in an elongate setting portion of the long-land die as the composite material is moved therethrough and shaped; cooling the composite material after it has moved out of the land-land die thereby to solidify the thermoplastic resin, and drawing the cooled composite material so as to pull the composite material through said long-land die.

4,394,339
PROCESS FOR PREPARING OPEN STRUCTURE FIBERS

Ronald E. Pfeiffer, Pensacola, and Francesco DeMaria, Gulf Breeze, both of Fla., assignors to American Cyanamid Company, Wayne, N.J.

Division of Ser. No. 13,344, Feb. 21, 1979, Pat. No. 4,316,714. This application Nov. 28, 1980, Ser. No. 210,935

Int. Cl.³ D01F *6/18*

U.S. Cl. 264—177 F **2 Claims**

1. A process for preparing open structure fiber which comprises extruding a fusion melt of acrylonitrile polymer and water through a spinnerette assembly which comprises in combination

a. a spinnerette plate containing a plurality of orifices with a counterbore for each oriffice and

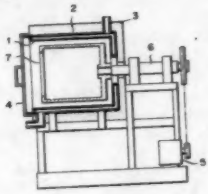
b. removable pins positioned within each orifice-counterbore combination, each pin being of solid construction and having an upper portion positioned within said counterbore and a lower portion positioned within said orifice, said upper portion occupying a fixed position within said counterbore and enabling spinning composition to flow through the counterbore to the orifice at operative back pressure and said lower portion contacting the wall of the

orifice at one position while providing clearance at other positions and having suitable shape characteristics to provide an open structure in the extrudate formed directly into a steam-pressurized solidification zone maintained under conditions of pressure and temperature which prevent formation of a sheath-core structure in the extrudate and enable orientation stretching of the extrudate to be achieved while said extrudate remains within said solidification zone.

4,394,340
METHOD OF PRODUCING THIN-WALLED ENDLESS BELT

Noriyoshi Tarumi, Hachioji; Hiroshi Tsuchiya, Iruma; Masakazu Kokiso, Tokyo, and Hiroaki Ohta, Yokohama, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo and Hokushin Industries Corporation, Yokohama, both of, Japan

Filed Oct. 28, 1981, Ser. No. 315,963
Claims priority, application Japan, Oct. 29, 1980, 55/151638
Int. Cl.³ B29C *5/04*
U.S. Cl. 264—219 **12 Claims**

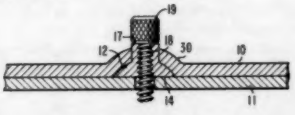


1. A method of producing a thin-walled endless belt having a thickness between 30 and 500 microns by centrifugal molding which comprises introducing a liquid curable silicone rubber dissolved in a solvent into a rotating cylindrical mold to coat the inner surface of said mold, hardening said liquid curable silicone rubber to form a silicone rubber coated mold surface on the inner surface of said cylindrical mold, and thereafter introducing into said rotating cylindrical mold a thermosetting resin which is at least one heat resistant resin selected from the group consisting of polyimide, polyamide-imide and polybenzimidazole resins dissolved in a volatile solvent onto said inner silicone rubber coated mold surface to coat said inner silicone rubber coated mold surface, then hardening said thermosetting resin and then removing said hardened thermosetting resin from said mold to form said endless belt having a thickness between 30 and 500 microns.

4,394,341
METHOD TO CENTER AND SEPARATE ELECTROFORMED REPLICAS FROM A MATRIX

Donald J. Wierschke, Brownsburg, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,533
Int. Cl.³ B29C *1/02*
U.S. Cl. 264—225 **6 Claims**



1. In the matrixng method employed in the manufacture of a molded record wherein a matrix, having a relief pattern defined in a surface thereof, which pattern includes a spiral information track positioned concentrically about an unrecorded center portion, is replicated by electroforming a metal on the surface of the matrix until a predetermined thickness of metal has been deposited and the replica thus formed is separated from the surface of the matrix, the improvement which comprises:

(a) providing an insert member having a surface which is passive to the metal to be electroformed on the matrix, said insert being an integral member having a given shape consisting of a base of a first diameter which is less than the diameter of the unrecorded portion of the matrix, a boss portion positioned normally and centrally with respect to the diameter of the base and being of a second diameter less than said first diameter, and a positive lead portion extending from the first diameter to the second diameter, said insert further including attaching means associated with said boss portion for securing a separation tool to said insert;

(b) positioning and securing said insert to the matrix with a securing means prior to electroforming metal on the matrix, said insert being placed with its base portion flush against the matrix at a position in the center unrecorded portion concentrically equidistant from the information track;

(c) electroforming the metal over the surface of the matrix and the positive lead portion of the insert to form a replica;

(d) removing securing means holding said insert to the matrix;

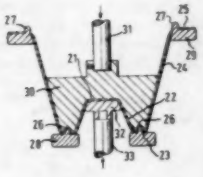
(e) securing a separation tool to the attaching means and

(f) applying a separation force to the separation tool to urge the replica away from the matrix, whereby the positive lead portion of the insert in combination with the tool applied provides the separation force at the center portion of the replica to assist in the separation of the replica from the surface of the matrix.

4,394,342
FORMING PLASTIC ARTICLES HAVING STRANDS BY STRETCHING

Frank B. Mercer, Blackburn, England, assignor to P.L.G. Research Limited, Blackburn, England

Filed Oct. 3, 1980, Ser. No. 193,729
Claims priority, application United Kingdom, Oct. 9, 1979, 7935034; Jul. 8, 1980, 8022318
Int. Cl.³ B29C *17/03*
U.S. Cl. 264—292 **13 Claims**



1. A method of making a plastic material article, comprising providing a piece of plastic starting material having a plurality of generally coaxial rings of holes or depressions therein, each hole or depression being separated from its adjacent hole or depression in the same ring by a zone, the sum of the cross-sectional areas of all the zones in a given ring being approximately equal to the sum of the cross-sectional areas of each other ring, the cross-sectional area of each zone being the multiplication product of (a) the shortest distance between adjacent holes or depressions and (b) the average thickness of the plastic starting material along that distance, said piece being substantially all at substantially the same temperature, and moving a first part of said piece which is within the rings with respect to a second part which is on the other side of the rings, in a direction generally at right angles to notional planes which generally intersect the holes or depressions of the respective rings,

thereby stretching said zones of said given and other rings into oriented strands, said zones in the given ring all being stretched to substantially the same stretch ratio and said zones in the other rings all being stretched to substantially the same stretch ratio.

4,394,343

PROCESS FOR THE FORMING OF COUPLING PIECES FROM A THERMOPLASTIC

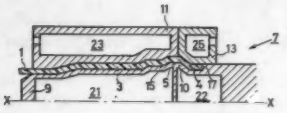
Petrus M. Acda, and Jacob Karreman, both of Enkhuizen, Netherlands, assignors to Polva Nederland B.V., Enkhuizen, Netherlands

Filed Dec. 12, 1979, Ser. No. 102,655

Claims priority, application Netherlands, Dec. 12, 1978, 7812063

Int. Cl.³ B29C *7/00*

U.S. Cl. 264—296 **3 Claims**



1. Process for the forming of coupling pieces from a thermoplastic, which coupling pieces comprise at least one annular undercut and present a free end and a terminal part which is located between the free end and the location of the greatest depth of the undercut and which is narrowed in the direction from the greatest depth of the undercut, in which process the thermoplastic is formed with the aid of a forming core which is provided with an annular rib, and the external surface of which corresponds to the internal surface of the coupling piece to be formed, the forming being carried out at a pressure and a temperature which are such that the forming core is closely surrounded by the thermoplastic, so as to form a coupling piece with an annular undercut, part of the coupling piece preformed in this way is cooled, the narrowed terminal part of the coupling piece, from the free end to the greatest depth of the undercut, being kept at a temperature which is such that this part remains elastically deformable, at least the part of the forming core provided with the annular rib is then withdrawn from the narrowed terminal part while provoking an elastic deformation of this terminal part, the elastically deformed terminal part is then cooled to a temperature at which the thermoplastic is no longer deformable, and the coupling piece formed in this way is completely withdrawn from the forming core, characterised in that the narrowed terminal part of the preformed coupling piece is postformed to give the desired final shape, after it has been elastically deformed and before it has completely cooled.

4,394,344

HEAT PIPES FOR USE IN A MAGNETIC FIELD

Richard W. Werner, San Ramon, and Myron A. Hoffman, Davis, both of Calif. (granted to U.S. Department of Energy under the provisions of 42 U.S.C. 2182)

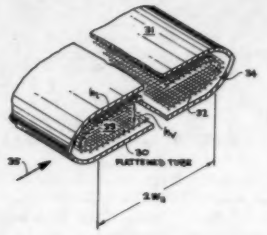
Filed Apr. 29, 1981, Ser. No. 258,818

Int. Cl.³ F28D *15/00*

U.S. Cl. 376—146 **10 Claims**

4. A heat pipe in combination with a magnetic field perpendicular to the longitudinal axis of the heat pipe, said heat pipe having a cross section wherein a first distance is greater than a second distance, said first distance being substantially parallel to said magnetic field, and said second distance being substantially perpendicular to said magnetic field, whereby magnetic pressure drop across said heat pipe is decreased while in the magnetic field.

8. In a magnetic confinement reactor having at least one heat pipe for transferring heat and positioned so that a longitudinal axis of the heat pipe is perpendicular to a magnetic field, the improvement comprising: a heat pipe constructed to decrease magnetic pressure drop thereacross and having a cross section with a first distance greater than a second distance, said first



distance being substantially parallel to said magnetic field and said second distance being substantially perpendicular to said magnetic field, whereby a magnetic pressure drop across the heat pipe is decreased.

4,394,345

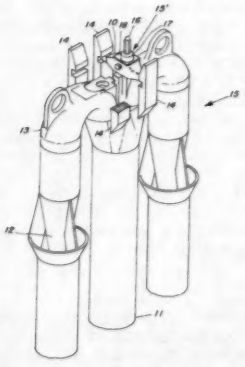
ULTRASONIC METHOD AND APPARATUS

John G. De Briere; Mary M. Lemanowicz; David L. Richardson, and Willem Vanderputten, all of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Dec. 29, 1980, Ser. No. 220,431

Int. Cl.³ G21C *17/00*

U.S. Cl. 376—245 **26 Claims**



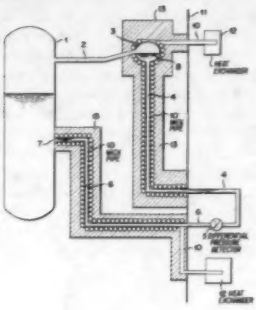
1. An apparatus for detecting cracks in the jet pump beam of a jet pump arrangement of a nuclear reactor, wherein said arrangement includes a downwardly directed jet pump having a nozzle for receiving pressurized driving water, a riser pipe positioned adjacent said jet pump for supplying said driving water, a pipe elbow connecting the top of said riser pipe to the inlet of said nozzle, and a removable jet pump beam assembly, including a jet pump beam bearing on said elbow to hold said elbow in place, said apparatus comprising an ultrasonic signal production means, and communicating means for communicating said signals from said production means to and from a jet pump beam, said communicating means being straddlingly mountable over a jet pump beam, and said ultrasonic signals being directionally oriented toward the upper surface of said jet pump beam, whereby incipient cracks appearing on said surface are timely ultrasonically detectable.

4,394,346

WATER LEVEL GAUGE FOR A NUCLEAR REACTOR

Shinichi Morooka, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 12, 1980, Ser. No. 215,635
Claims priority, application Japan, Dec. 20, 1979, 54-175507[U]; Jan. 29, 1980, 55-8578[U]
Int. Cl.³ G01F 23/16; G21C 17/02
U.S. Cl. 376—258 5 Claims



1. A water level gauge for a nuclear reactor having a reference water level container communicating with a fluid in the upper part of a nuclear reactor pressure vessel through an upper part pressure tube, a differential pressure detector with two inlets for detecting a differential pressure between the reference water level in the reference water level container and the water level inside the nuclear reactor pressure vessel, a reference water head tube connecting one of said two inlets of the differential pressure detector with the reference water level container, and a lower part pressure tube connecting the other inlet of the differential pressure detector with a predetermined measuring point of part of the nuclear reactor pressure vessel, characterized by further comprising heat conduction means for absorbing heat from the reference water head water inside said reference water head tube and from the water inside said lower part pressure tube and for conducting the heat to the outside of a housing of the nuclear reactor pressure vessel, and a heat exchanger for removing the heat conducted to the outside of the housing by said heat conduction means.

4,394,347

BRAZING FILLER METAL COMPOSITION AND PROCESS

John H. McMurray, Stratford, and Jule Miller, Derby, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Jul. 9, 1981, Ser. No. 281,793
Int. Cl.³ C22C 19/05
U.S. Cl. 420—453 2 Claims

1. A brazing filler metal composition consisting essentially of, by weight, from about 8.0% to about 11.0% chromium; from about 2.0% to about 3.0% boron; from about 3.0% to about 4.5% silicon; from about 2.5% to about 4.0% iron; from about 7.0% to about 9.0% tungsten; a maximum of 0.06% carbon and the remainder nickel.

4,394,348

PROCESS FOR THE PREPARATION OF ALUMINIUM ALLOYS

Francis R. F. Hardy, Chester, and Martin G. Griffiths, Warrington, both of England, assignors to Interox Chemicals Ltd., London, England

Filed Sep. 22, 1980, Ser. No. 189,163
Claims priority, application United Kingdom, Oct. 15, 1979, 7935699
Int. Cl.³ C22C 1/02
U.S. Cl. 420—528 14 Claims

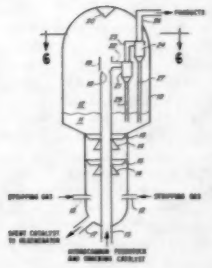
1. In a process for the production of a strontium-modified aluminium alloy which comprises admixing an aluminium-bearing material and a strontium-bearing material, said aluminium-bearing material consisting of aluminium or aluminium alloyed with at least one member selected from the group consisting of magnesium and silicon, and heating the admixed materials to form a strontium-modified aluminium alloy, the improvement wherein said strontium-bearing material comprises strontium peroxide.

4,394,349

APPARATUS FOR THE FLUIDIZED CATALYTIC CRACKING OF HYDROCARBON FEEDSTOCK

Robert R. Cartmell, Crown Point, Ind., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 6, 1981, Ser. No. 280,901
Int. Cl.³ F27B 15/08; C10G 35/14, 47/30
U.S. Cl. 422—147 6 Claims



1. An apparatus for the fluidized catalytic cracking of a hydrocarbon feedstock, the apparatus comprising:

(a) a disengaging vessel having a dense catalyst phase and a dilute catalyst phase;

(b) a vertically ascending riser reactor having means at its upstream end for the introduction of the feedstock and the catalyst, the riser reactor further having a downstream end communicating with the interior of the vessel;

(c) a collar having two open ends in communication with the interior of said disengaging vessel and positioned along the same axis as the downstream end of the riser reactor, the collar further being positioned in close proximity to, but not in contact with, the riser reactor such that an annular space is defined between the riser reactor and the collar, the collar having a diameter greater than the diameter of the riser reactor at its downstream end; and

(d) a cyclone separation system located within the vessel and having:

(i) an outlet communicating with the interior of the vessel to discharge catalyst into the dense phase;

(ii) an outlet connected to vent the cracked hydrocarbons outside the vessel; and

(iii) an inlet directly and laterally communicating with the collar;

whereby vapors from the vessel may enter the annular space defined by the collar through one open end thereof and

may thereafter enter the cyclone separation system through said inlet.

4,394,350

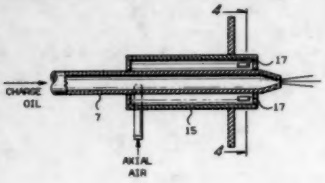
METHOD AND APPARATUS FOR VORTEX FLOW CARBON BLACK PRODUCTION

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 145,094, Apr. 30, 1980, Pat. No. 4,321,248. This application Nov. 6, 1981, Ser. No. 318,780

Int. Cl.³ C09C *1/48*; B01J *10/00*

U.S. Cl. 422—150 **5 Claims**



1. An apparatus for producing carbon black which comprises:

(a) a carbon black reactor having at least a combustion zone,

(b) a means for introducing combustion gas in a precombustion or combustion zone of said carbon black reactor in a manner to produce a vortex of combustion gases traveling axially in said reactor, and

(c) a means for producing an axially moving vortex of fluid which contains feedstock internally to said combustion gas vortex said means for producing a feedstock containing vortex comprising (1) a first centrally located tubular member with a feedstock outlet nozzle at the downstream end and (2) a second tubular member, closed at both ends, and disposed about said first tubular member to form an annular space, the downstream end of said second member being located upstream of said feedstock outlet, said second member having an inlet means for cooling air at the upstream end and a plurality of tangential slots circumferentially disposed at the downstream end to produce a flow of a fluid which contains feedstock in a vortex of cooling air moving axially in said reactor interfacing with the vortex of (b) under conditions to produce carbon black.

4,394,351

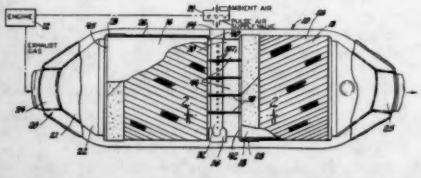
DUAL-MONOLITH CATALYTIC CONVERTER WITH SECONDARY AIR INJECTION

Richard A. Gast, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 8, 1981, Ser. No. 299,843

Int. Cl.³ F01N *3/32*

U.S. Cl. 422—171 **6 Claims**



1. For use with an exhaust gas pulsed air supply means providing a pulsed air supply, a dualmonolith catalytic converter adapted to receive exhaust gases and having an upstream located substrate with a catalyst and an in-line downstream located substrate with a catalyst cooperating to purify the exhaust gases, said converter having a configuration such that exhaust gas flow is non-uniformly distributed across the upstream frontal areas of each of the substrates, said converter further having a chamber located between said substrates, an air distribution tube having an open end adapted to be connected to said pulsed air supply and extending through and across said chamber and terminating with a closed end, said tube within said chamber having a plurality of holes which are sized and spaced along said tube such that they nonuniformly distribute the pulsed air supply throughout said chamber in a manner to provide a resultant air flow distribution conforming with the non-uniform distribution of exhaust gas, a plurality of flow dividers spaced along said tube and extending substantially parallel to each other in a manner to partition said chamber into a plurality of discrete channels each open to selected ones of said holes to receive one portion only of the non-uniform distribution of the pulsed air supply and one portion only of the non-uniformly distributed exhaust gas whereby said non-uniform air flow distribution is maintained between said channels while said exhaust gas is flowing between said substrates to prevent the exhaust gas from entering the downstream substrate with an improper mix of pulsed air so that the conversion efficiency of said downstream substrate is maximized.

4,394,352

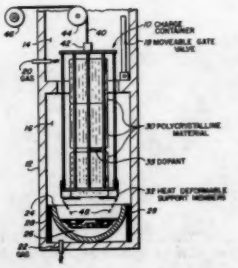
MELT RECHARGE APPARATUS

Robert W. Helda, deceased, late of Scottsdale, Ariz.; by Cynthia Hazeltine, executor, Phoenix, and H. Ming Liaw, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 17, 1980, Ser. No. 130,913

Int. Cl.³ C30B *15/02*

U.S. Cl. 422—232 **3 Claims**



1. An improved recharging apparatus including a container into which charge material can be loaded, wherein the improvement comprises thermally deformable tantalum support means closing an end of said container and capable at room temperature of supporting the weight of said charge material, said means deformable at an elevated temperature to release said charge material.

4,394,353

SEPARATION OF RARE EARTH METALS USING A CATION EXCHANGER

Tetsuya Miyake, Tokyo; Kunihiko Takeda, Yokohama; Hatsuki Onitsuka, Fujisawa; Kazuo Okuyama, Yokohama, and Yasuki Shimamura, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 4, 1980, Ser. No. 213,110

Claims priority, application Japan, Dec. 19, 1979, 54-165245; Dec. 20, 1979, 54-166087; Apr. 30, 1980, 55-57472; Aug. 5, 1980, 55-107302; Aug. 8, 1980, 55-109068; Aug. 9, 1980, 55-109644; Aug. 11, 1980, 55-110068; Aug. 12, 1980, 55-110493; Aug. 27, 1980, 55-117968

Int. Cl.³ C01F *17/00*

U.S. Cl. 423—21.5 10 Claims

1. In a process for the separation of one rare earth metal from another in a mixture of rare earth metals by passing a retaining agent solution through a bed of a cation exchanger to convert the cation exchanger into that of a retaining agent type, passing a solution of the mixture through the cation exchanger to form a rare earth metal adsorption zone on the bed of the cation exchanger, passing a complexing agent solution through the cation exchanger to effect migration of the rare earth metal adsorption zone through the bed of the cation exchanger and separating a fraction of one of the rare earth metals, the improvement which comprises using as the cation exchanger a cation exchanger having a micro-void volume ratio of 0.58 to 0.95 and a degree of crosslinking of 8 to 17 or having a micro-void volume ratio of 0.50 to 0.95 and a degree of crosslinking of 17 to 80 and passing the materials through the cation exchanger at a rate such that the migration velocity of the rare earth metal adsorption zone through the cation exchanger is from about 5 m per day to about 500 m per day.

4,394,354

SILVER REMOVAL WITH HALOGEN IMPREGNATED ACTIVATED CARBON

Ronald S. Joyce, Pittsburgh, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Filed Sep. 28, 1981, Ser. No. 305,889

Int. Cl.³ C22B *11/00*

U.S. Cl. 423—25 6 Claims

1. A process for removing the anionic silver thiosulfate complex from an aqueous solution comprising contacting said solution with halogen impregnated activated carbon containing at least 0.1 weight percent halogen, said halogen being selected from the group consisting of iodine, bromine or any combination of iodine and bromine.

4,394,355

RECOVERY OF CATALYTICALLY-USEFUL COBALT AND LIKE METAL MOIETIES FROM THEIR SOLID OXALATES WITH EDTA SALTS

James D. Fruge', Pampa, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 2, 1982, Ser. No. 354,251

Int. Cl.³ C07C *51/235, 55/07;* C01G *51/00, 3/00*

U.S. Cl. 423—27 9 Claims

1. In a process for treating a solid comprising the oxalate of a metal of the group consisting of cobalt, copper, and manganese to recover therefrom an aqueous solution containing a water-soluble salt of said metal substantially free from oxalate moiety, the improvement which comprises:

leaching said solid with an aqueous solution of a water-soluble salt of ethylenediaminetetraacetic acid (EDTA) to form a leach liquor containing in solution the metal moiety of said metal oxalate in the form of the EDTA-metal complex;

mixing said leach liquor with a solution containing dissolved calcium ions in a quantity at least stoichiometrically equivalent to the oxalate ions contained in said leach liquor to form a mixture comprising a precipitate of solid calcium oxalate and a solution containing said EDTA-metal complex;

separating said calcium oxalate precipitate from said mixture to produce a clarified solution of said EDTA-metal complex;

acidifying said clarified solution with an effective amount of a strong acid to decompose said complex to form solid EDTA and a dissolved salt of said metal; and

removing said solid EDTA from said acidified solution leaving said metal salt dissolved therein.

8. In a process for oxidizing an organic feedstock with a catalyst comprising cobalt in a liquid phase comprising a carboxylic acid to produce a liquid oxidate comprising a carboxylic acid and wherein cobalt initially contained in said catalyst is converted to cobalt oxalate, in which process said cobalt oxalate is separated as a solid from said oxidate and converted to a cobalt salt which can be re-used as catalyst in said process, the improvement which comprises;

leaching said solid with an aqueous solution of a water-soluble salt of ethylenediaminetetraacetic acid (EDTA) to form a leach liquor containing in solution the cobalt moiety of said cobalt oxalate in the form of the EDTA-cobalt complex:

mixing said leach liquor with a solution containing a quantity of calcium ions sufficient to react with said complex to form a mixture comprising a precipitate of solid calcium oxalate and a solution containing said EDTA-cobalt complex;

separating said calcium oxalate precipitate from said mixture to produce a remaining clarified solution of said EDTA cobalt complex;

acidifying said clarified solution with an effective amount of a strong acid other than sulfuric acid to decompose said complex to form solid EDTA and a dissolved cobalt salt;

removing said solid EDTA from said acidified solution leaving a clarified cobalt salt solution; and

returning said clarified cobalt salt solution to said oxidation process for re-use as catalyst therein.

4,394,356

RECUPERATION OF CYANIDES FROM RINSING SOLUTIONS OF CYANIDRIC PROCESSES FOR ELETRODEPOSITION OF METALS

Michael F. Peuser, Rua Princesa Isabel, 266, Apto 181, Sao Paulo 04601, and Jose B. Bartolo, Nicolau-210-Diadema, San Paulo 09900, both of Brazil

PCT No. PCT/BR80/00002, § 371 Date Sep. 25, 1980, § 102(e) Date Sep. 25, 1980, PCT Pub. No. WO80/01563, PCT Pub. Date Aug. 7, 1980

PCT Filed Jan. 18, 1980, Ser. No. 285,222

Int. Cl.³ C01C *3/08;* C02F *1/58*

U.S. Cl. 423—43 3 Claims

1. A process for recuperation of a cyanide from a rinsing solution of a cyanidric process for electrodeposition of copper, the solution containing a soluble complex cyanide of an alkali metal and copper, comprising adding to the solution a soluble simple salt of bivalent copper reacting with said complex cyanide and any free cyanide ions in said solution to form and precipitate an insoluble cyanide of copper, and separating said precipitant for reuse, said precipitation, being conducted without using hydrochloric acid by adding sodium bisulfite to the solution to reduce the pH of the solution to between 1.5 and 4.0 and the copper ion of the simple salt to a cuprous state for precipitating insoluble cuprous cyanide.

3. A process for recuperation of a cyanide from a rinsing solution of a cyanidric process for electrodeposition of cadmium, the solution containing a soluble complex cyanide of an alkali metal and cadmium, comprising conducting the process in two stages, in a first whereof the solution is diluted to a cadmium content below 17 g/l, a soluble salt of zinc and a strong acid is added to the diluted solution to precipitate insoluble zinc cyanide, and the precipitate is separated from the solution, and in the second stage adding to the solution from

the first stage an alkali compound reacting with cadmium ions in the solution to form and precipitate an insoluble cadmium salt, and separating the precipitate.

4,394,357

SEPARATION OF COBALT AND NICKEL BY OXIDATIVE PRECIPITATION WITH PEROXYMONOSULFURIC ACID

Diana M. Mounsey, Runcorn, and David B. Mobbs, Handforth, both of England, assignors to Interox Chemicals Ltd., London, England

Filed Nov. 16, 1981, Ser. No. 321,575

Claims priority, application United Kingdom, Dec. 5, 1980, 8039084

Int. Cl.³ C01G 51/00

U.S. Cl. 423—140 19 Claims

1. In a process for the separation of cobalt and nickel from an aqueous acidic sulphate solution thereof in which Caro's Acid is introduced into said aqueous solution, and is at least partially neutralised by introduction of a neutralising agent, resulting in a cobalt-containing precipitate, and the resultant precipitate is separated from the residual aqueous phase, the improvement which comprises employing at least a stoichiometric amount of Caro's Acid based on the amount of peroxomonosulphuric acid required theoretically to oxidise all the cobalt in solution to cobalt (III), said Caro's Acid containing not more than 1 mole of hydrogen peroxide per 8 moles of peroxomonosulphuric acid, maintaining the aqueous solution of cobalt and nickel at a pH of not more than pH 4.7 and at a minimum pH ranging from pH 3.1 when the nickel to cobalt mole ratio in the solution before Caro's Acid introduction is 1:1 or lower up to pH 3.5 when said mole ratio is 40:1 or higher, by introduction thereinto of an alkali metal hydroxide or carbonate, for a period of at least 2 hours after introduction of Caro's Acid solution commences, during which period cobalt hydroxide precipitates out of solution.

4,394,358

PRODUCTION OF GRANULAR ALKALI METAL DIPHOSPHATES OR TRIPHOSPHATES

Alexander Maurer; Renate Adrian; Herbert Panter, all of Hürth; Gero Heymer, and Dieter Nölker, both of Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 17, 1981, Ser. No. 303,100

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1980, 3035820

Int. Cl.³ C01B 25/30

U.S. Cl. 423—305 9 Claims

1. In the process for making granular, partially or completely hydrated alkali metal diphosphates or triphosphates, wherein pulverulent, anhydrous or partially hydrated alkali metal diphosphates or triphosphates are intensively mixed and granulated in the presence of water and a phosphate salt other than the alkali metal diphosphate or triphosphate, the improvement which comprises: intensively mixing and granulating alkali metal diphosphates or triphosphates consisting to an extent of at least 20% of particles with a size of less than 0.045 mm and hydrated to an extent of less than 90%, based on the phosphates' theoretical content of water of hydration, in the presence of a quantity of water at most necessary for completely hydrating the alkali metal diphosphates or triphosphates and in the presence of an ammonium polyphosphate, this latter presenting a degree of condensation of 3 up to about 1000 and being used in proportion of about 0.5 to 50 weight %, based on the quantity of water used.

4,394,359

PROCESS FOR MAKING GRANULATED CONDENSED PHOSPHATES

Horst-Dieter Wasel-Nielen; Alexander Maurer, and Renate Adrian, all of Hürth, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 18, 1981, Ser. No. 303,425

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1980, 3035805

Int. Cl.³ C01B 25/40

U.S. Cl. 423—305 8 Claims

1. A process for converting pulverulent, water-soluble, condensed phosphates of the following general formula (I)

$$M_2O(MPO_3)_n$$

in which M stands for sodium, potassium or ammonium and n stands for a number between 4 and about 100, to a granulate, wherein the pulverulent, water-soluble, condensed phosphate is thoroughly agitated and granulated in the presence of water and of a phosphate salt other than the condensed phosphate, which comprises: thoroughly agitating and granulating a condonsed phosphate of the general formula (I) or a mixture of the phosphate with an anhydrous or partially hydrated alkali metal phosphate in the presence of water and aiding the formation of a granulate from the pulverulent material with a granulating aid comprising an ammonium polyphosphate of the following general formula (II)

$$H_{(n-m)+2}(NH_4)_mP_nO_{3n+1}$$

in which n stands for an integral average value of 3 to 1000, m stands for a whole number of up to n+2, and the m/n-ratio is between about 1.0 and 1.67, the water being used in a proportion of about 0.05 to 5.0 weight %, the ammonium polyphosphate of general formula (II) being used in a granulation-assisting proportion of about 0.003 to 1 weight %- and the alkali metal phosphate being used in a proportion of up to about 40 weight %, the percentages being all based on the quantity of the condensed phosphate of general formula (I).

4,394,360

PROCESS FOR REDUCING IRON IN PHOSPHORIC ACID SOLUTION

Klaus Schrödter, and Klaus Lehr, both of Hürth, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 325,811

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1980, 3045645

Int. Cl.³ C01B 15/16, 25/26

U.S. Cl. 423—317 9 Claims

1. A process for reducing iron from the trivalent to bivalent oxidation stage with the aid of a reductant, the iron being present in phosphoric acid solution, which comprises using red phosphorus as the reductant and effecting the reduction in the presence of at least 5 ppm of copper, based on the weight of the solution at temperatures within the range of 10° to 90° C. by keeping the red phosphorus in contact with the iron-containing phosphoric acid solution over a period at least necessary for the reduction of iron.

4,394,361

METHOD OF PURIFYING PHOSPHORIC ACID

Sidney Berkowitz, Highland Park, and Richard A. Mohr, Martinsville, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed May 24, 1982, Ser. No. 381,279

Int. Cl.³ C01B 25/16

U.S. Cl. 423—321 S 12 Claims

1. In the purification of wet process phosphoric acid by the solvent extraction of sulfuric acid acidulated phosphatic ores

wherein there is formed an aqueous phase containing the major part of the impurities and a solvent phase containing purified phosphoric acid and separating both said phases, and recovering the phosphoric acid the improvement which comprises extracting the phosphoric acid with an organic, essentially water-insoluble liquid extractant consisting essentially of an organic phosphate selected from the group consisting of an alkyl phosphate, an aryl phosphate or an alkyl aryl phosphate diluted with an organic solvent selected from the class consisting of diisobutyl ketone, acetophenone, benzophenone, 3-octanone, 1-octanol and 1-decanol.

4,394,362

CRYSTALLINE SILICATE PARTICLE HAVING AN ALUMINUM-CONTAINING OUTER SHELL

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 28, 1981, Ser. No. 258,497

Int. Cl.³ C01B *33/28*; B01J *29/06*

U.S. Cl. 423—328 **20 Claims**

1. A particle, comprising an inner portion and an outer portion disposed as a shell around said inner portion wherein said outer portion has the same crystal structure as said inner portion, said inner portion comprising an intermediate pore size crystalline silicate having a silica:alumina mole ratio greater than about 200:1, and said outer portion having a silica:alumina mole ratio of less than about 100:1 and wherein said particle is prepared by a process comprising:

(1) initiating crystallization in a crystallization medium substantially free of aluminum to produce the intermediate pore size crystalline silicate;

(2) adding a source of aluminum to said crystallization medium; and

(3) crystallizing onto said crystalline silicate the isostructural outer portion which comprises alumina.

4,394,363

PROCESS FOR THE GRANULATION OF PRECIPITATION PRODUCTS FORMED FROM AMMONIUM COMPOUNDS

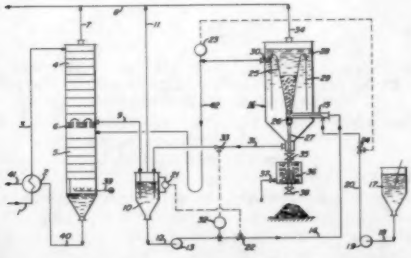
Egon Haese, Bochum; Rolf Willms, Witten, and Karl D. Schultheiss, Bochum, all of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Continuation of Ser. No. 115,648, Jan. 28, 1980, abandoned. This application Apr. 29, 1981, Ser. No. 258,880

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1979, 2903289

Int. Cl.³ C01C *1/02*

U.S. Cl. 423—356 **6 Claims**



1. A process for the granulation of precipitation products formed from the reaction of ammonium compounds with alkaline-earth compounds, which comprises introducing into a liquid-filled reaction chamber above the bottom thereof a first aqueous stream containing the said ammonium compounds and introducing a second aqueous stream containing the said alkaline-earth compounds such that the said alkaline-earth compounds are immediately and intimately mixed with the said ammonium compounds to effect a liquid phase reaction and form alkaline-earth compound precipitation products in the form of granules which are difficultly soluble in water, withdrawing the said granules from the bottom of the said reaction chamber and separately recovering from said reaction chamber a third aqueous stream containing an essentially particle-free aqueous solution of free ammonia and a fourth aqueous stream containing an aqueous solution of free ammonia and suspended particles of said precipitation products.

4,394,364

SEPARATION OF BORIC ACID FROM MIXTURES THEREOF WITH SULPHURIC ACID

Josef Hakl, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 960,814, Nov. 15, 1978, abandoned. This application Jul. 16, 1979, Ser. No. 57,740

Claims priority, application Switzerland, Nov. 16, 1977, 13992/77

Int. Cl.³ C01B *35/10, 17/90*

U.S. Cl. 423—483 **11 Claims**

1. A process for the separation of boric acid from a boric acid-containing aqueous sulphuric acid mother liquor, the concentration of boric acid in said mother liquor being at least 2% by weight based on the H_2SO_4, comprising adjusting the concentration of the sulphuric acid towards 50% by weight H_2SO_4, based on H_2SO_4 and H_2O, with the proviso that the final concentration lies within the range of from 49 to 51% by weight, and with the further proviso that where the initial sulphuric acid is dilute, the concentration thereof is adjusted towards 50% by weight by distilling off water, and then separating the boric acid which precipitates out of the mother liquor.

4,394,365

METHOD FOR CURTAILING PHOSPHOROUS IMPURITY IN THE PRODUCTION OF HYDROGEN FLUORIDE

Bohdan Gnyra, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Dec. 17, 1981, Ser. No. 331,772

Claims priority, application United Kingdom, Jan. 5, 1981, 8100110

Int. Cl.³ C01B *7/22*

U.S. Cl. 423—485 **8 Claims**

1. A process for the production of hydrogen fluoride by reaction of sulphuric acid of a concentration in excess of 95% by weight at a temperature of 195°–240° C. with fluorspar, containing phosphorous impurities, characterised in that for the purpose of reducing the phosphorous impurities in the generated gaseous hydrogen fluoride, the reaction of sulphuric acid with fluorspar is carried out in the presence of aluminium sulphate in an amount of about 0.4–2.5%, expressed as % Al on the basis of the fluorspar.

4,394,366

PROCESS FOR PRODUCTION OF $COCL_2$ SOLUTION FROM COBALTIC OXIDE-HYDRATE

Victor A. Ettel, Mississauga; Eric A. Devuyst, Toronto, and Alexander Illis, Mississauga, all of Canada, assignors to Inco Limited, Toronto, Canada

Filed May 4, 1981, Ser. No. 260,059

Claims priority, application Canada, Nov. 14, 1980, 364745

Int. Cl.³ C01G *53/08*

U.S. Cl. 423—493 **5 Claims**

1. A process for producing cobaltous chloride from cobaltic hydroxide while avoiding the generation of chlorine which comprises slurrying in water cobaltic hydroxide to be dissolved and treating the resulting slurry with a reducing agent from the group consisting of methanol, formaldehyde and formic acid and with hydrochloric acid such that the contact

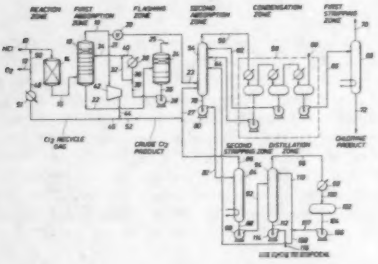
of said acid with said slurry occurs in the presence of said reducing agent and the rate of said acid addition is controlled to maintain the slurry at a pH above 1.

4,394,367

PROCESS FOR RECOVERY OF CHLORINE FROM HYDROGEN CHLORIDE

Elton G. Foster, Houston, Tex., assignor to Shell Oil Co., Houston, Tex.

Filed Mar. 11, 1982, Ser. No. 357,031
Int. Cl.³ C01B 7/04
U.S. Cl. 423—502 **6 Claims**



1. In a process wherein chlorine is produced by contacting oxygen and hydrogen chloride and minor amounts of organic impurities in the presence of a chloride of a metal having an atomic number of 21 to 30, both inclusive, at hydrogen chloride oxidizing conditions in a reaction zone thereby forming a reaction mixture comprising chlorine, hydrogen chloride, water, carbon dioxide and halogenated impurities, the steps which comprise

(a) contacting said reaction mixture in a first absorption with zone with sulfuric acid having a temperature lower than the temperature of the reaction mixture exiting the reaction zone to partially cool and to dry said reaction mixture;

(b) contacting the partially cooled reaction product from step (a) in a second absorption zone with carbon tetrachloride thereby absorbing in said carbon tetrachloride substantially all of the halogenated impurities and a small amount of the chlorine contained in said partially cooled reaction product;

(c) cooling the unabsorbed product from step (b) in a condensing zone thereby forming in said condensing zone a liquid phase consisting essentially of chlorine and hydrogen chloride, and a vapor phase consisting essentially of unreacted oxygen, carbon dioxide and hydrogen chloride;

(d) stripping said liquid phase from step (c) in a first stripping zone to remove as overhead hydrogen chloride and removing chlorine as bottom product;

(e) stripping the absorption product from step (b) in a second stripping zone to remove chlorine as an overhead stream and leaving a bottom product comprising carbon tetrachloride, and impurities which originated from the reaction zone; and

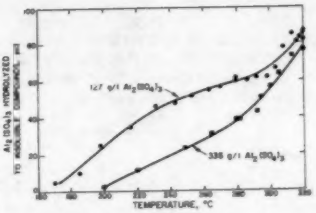
(f) distilling by fractional distillation said bottoms product from step (e) in a distillation zone to recover carbon tetrachloride as overhead product, said distillation column being operated at a pressure sufficient to remove said impurities as a liquid bottoms product.

4,394,368

HIGH TEMPERATURE HYDROLYSIS OF ALUMINUM SULFATE SOLUTIONS

Donald E. Shanks, Reno, Nev., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 4, 1981, Ser. No. 327,539
Int. Cl.³ C01F 7/26, 7/74
U.S. Cl. 423—556 **3 Claims**



1. A process for hydrolysis of dilute aqueous aluminum sulfate solution containing about 100–300 grams per liter of aluminum sulfate and minor amounts of impurities consisting essentially of maintaining said solution in a closed system at a hydrolysis temperature above 300° C. for a time sufficient to convert a high percentage of the aluminum sulfate to the insoluble basic aluminum sulfate, $Al(OH)SO_4$, and subsequently quenching the closed system in water.

4,394,369

HYDROGEN PEROXIDE PROCESS

Wayne Ranbom, Pennington, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed May 24, 1982, Ser. No. 381,592
Int. Cl.³ C01B 15/02
U.S. Cl. 423—588 **14 Claims**

1. An improved process for producing hydrogen peroxide by the alternate reduction and oxidation of a substituted anthraquinone and its tetrahydro derivative as the working compound, dissolved in a solvent to constitute a liquid working solution wherein the improvement resides in using a solvent comprising an N-substituted-2-pyrrolidone wherein the substituted moiety is a hydrocarbon containing 6 to 12 carbon atoms.

4,394,370

BONE GRAFT MATERIAL FOR OSSEOUS DEFECTS AND METHOD OF MAKING SAME

Steven R. Jefferies, 5802 Leith Walk, Baltimore, Md. 21239

Filed Sep. 21, 1981, Ser. No. 304,367
Int. Cl.³ A61K 9/00, 35/32
U.S. Cl. 424—15 **12 Claims**

1. A bone graft material capable of inducing the formation of osseous tissue in the animal in which it is implanted, said bone graft material consisting essentially of a collagen conjugate containing:

from about 65 to about 95 weight percent reconstituted collagen having dispersed substantially uniformly therein

from about 35 to about 5 weight percent of (a) demineralized bone particles, (b) solubilized bone morphogenic protein, or (c) mixtures of demineralized bone particles and solubilized bone morphogenic protein,

said bone graft material adapted to induce the formation of osseous tissue when implanted in an animal.

4,394,371

DENTRIFRICE PREPARATION

Giacinto G. Barberio, Urmston, England, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 7, 1982, Ser. No. 366,260

Claims priority, application United Kingdom, Apr. 7, 1981, 81/10857

Int. Cl.³ A61K 7/16, 7/18

U.S. Cl. 424—52 4 Claims

1. A dentifrice preparation in an unlined aluminium tube containing a dentifrice vehicle and dispersed therein a non-toxic anticaries amount of a water-soluble alkali metal mono-fluorophosphate, 20–75% by weight of dentally acceptable alkaline earth metal orthosphosphate polishing material, 0.01–20% by weight of a water-soluble sodium trimetaphosphate and an amount of at least 0.4% by weight phytic acid effective to reduce attack by the dentifrice on the aluminium of an unlined aluminium tube.

4,394,372

PROCESS FOR MAKING LIPID MEMBRANE STRUCTURES

James L. Taylor, Naperville, Ill., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 219,186, Dec. 22, 1980, abandoned. This application Jan. 15, 1982, Ser. No. 339,567

Int. Cl.³ A61K 45/02, 37/26, 47/00

U.S. Cl. 424—85 18 Claims

1. A process for producing vesicles wherein a solution containing lipids, amphiphiles and other membrane materials, capable of forming vesicles, in a solvent system is dispersed in an aqueous solution and, subsequently, at least a portion of that solvent system is stripped off, characterized in that said solvent system comprises at least two organic components, S_1 and S_2, wherein:

(a) S_1 is highly soluble in the aqueous solution;

(b) S_2 is hydrophobic;

(c) S_2 is more volatile than the aqueous solution;

(d) the membrane materials are not entirely soluble in S_2 alone;

(e) the mixture of S_1 and S_2 forms an interface with the aqueous solution; and

(f) the membrane materials may be dissolved in a mixture of S_1 and S_2.

4,394,373

METHOD OF ACHIEVING HEMOSTASIS

William G. Malette, 667 Parkwood La., Omaha, Nebr. 68132, and Herbert J. Quigley, Jr., 9511 Mockingbird Dr., Omaha, Nebr. 68127

Filed Apr. 6, 1981, Ser. No. 251,321

Int. Cl.³ A61K 31/60, 35/56

U.S. Cl. 424—95 14 Claims

1. The method of achieving hemostasis in bleeding open wounds which comprises placing chitosan in contact with the wound.

4,394,374

THYMUS GLAND EXTRACTS

Richard N. Ushijima, 43 Nanea Ave., Wahiawa, Hi. 96786

Filed Jun. 15, 1981, Ser. No. 273,581

Int. Cl.³ A61K 7/32

U.S. Cl. 424—95 16 Claims

1. A process for producing a thymus extract in the substantial absence of added acids and organic solvents comprising:

comminuting defatted thymus glands;

mixing the comminuted glands with water at a ratio of not more than 300 g of comminuted glands per 400 ml of water;

maintaining the resulting mixture at an elevated temperature and for a time sufficient that large proteins and proteolytic enzymes are at least partially denatured;

mechanically separating the mixture, by centrifugation or equivalent means, into oils, undissolved solids, and an aqueous solution including protein substances;

decanting to isolate the aqueous solution;

after the aforesaid steps, forming a precipitate including the protein substances by adding a source of sulfate ions to the aqueous solution in an amount sufficient to produce a precipitate yield at least as great as a yield obtained when from 400 to 600 ml. of distilled water are mixed with each 300 g. of comminuted glands to produce the aqueous solution and from 9.5 to eleven parts to saturated ammonium sulfate solution are combined with each seven parts of the aqueous solution at room temperature;

separating the precipitate from supernatant liquid by centrifugation or equivalent means;

combining the precipitate with water so that a portion of the precipitate dissolves to form an extract solution;

dializing the extract solution to remove dissolved, low molecular weight substances from the extract solution; and

purifying the extract solution by removing any undissolved precipitate from the extract solution by centrifugation or equivalent means.

4,394,375

CEPHALOSPORIN DERIVATIVES, AND COMPOSITIONS CONTAINING THEM

Peter H. Bentley; Kenneth D. Hardy, and Peter H. Milner, all of Horsham, England, assignors to Beecham Group Limited, England

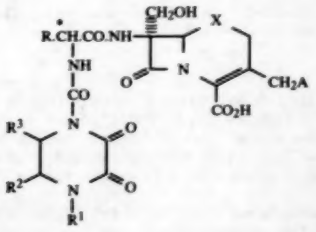
Filed Jun. 5, 1981, Ser. No. 271,008

Claims priority, application United Kingdom, Jun. 6, 1980, 8018674

Int. Cl.³ A61K 31/545; C07D 501/57

U.S. Cl. 424—114 13 Claims

1. A compound of formula (I) or a pharmaceutically acceptable salt or in vivo hydrolysable ester thereof:



(I)

wherein

R is phenyl, 4-hydroxyphenyl, or a 5- or 6-membered heterocyclic ring containing up to three heteroatoms selected from oxygen, sulphur or nitrogen, optionally substituted with hydroxy, amino, halogen or C_{1-6} alkoxy;

R^1 represents hydrogen or C_{1-6} alkyl;

R^2 and R^3 are the same or different and represent hydrogen, C_{1-6} alkyl, halogen, amino, hydroxy, or C_{1-6} alkoxy;

X represents oxygen or sulphur; and

A represents hydrogen, or acetoxy.

4,394,376

METHOD FOR PREVENTING HYPERTRIGLYCERIDEMIA

Hiroshi Kamimae, Yokohama, and Tadashi Ishikawa, Sagamihara, both of Japan, assignors to Nihon Nosan Kogyo K.K., Yokohama, Japan

Filed Feb. 22, 1982, Ser. No. 351,176

Claims priority, application Japan, Feb. 25, 1981, 56-025428

Int. Cl.³ A61K 33/18

U.S. Cl. 424—150 5 Claims

1. A method for preventing hypertriglyceridemia in humans

comprising ingesting a hypertriglyceridemia preventing amount of iodine-enriched whole egg or egg yolk in the daily diet.

4,394,377

RUMINANT ANIMAL PERFORMANCE BY CO-ADMINISTERING CHOLINE AND PROPIONATE ENCHANCERS

Howard R. Spires, Sunnyvale, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 31, 1981, Ser. No. 289,001
Int. Cl.³ A61K 37/00, 31/35, 31/14
U.S. Cl. 424—177 32 Claims

1. A method for increasing the availability of supplemental dietary choline to an animal with a developed rumen, which method comprises co-administering a diet-supplementing amount of choline or a choline compound with a propionate-enhancing amount of a propionate-enhancing antibiotic compound.

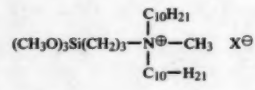
4,394,378

3-(TRIMETHOXYSILYL) PROPYLDIDECYLMETHYL AMMONIUM SALTS AND METHOD OF INHIBITING GROWTH OF MICROORGANISMS THEREWITH

Stewart E. Klein, Richardson La., Harrison, N.Y. 10528

Filed Jul. 8, 1981, Ser. No. 281,319
Int. Cl.³ C07F 7/10; A61L 13/00
U.S. Cl. 424—184 9 Claims

1. A silyl quaternary ammonium compound having the formula



wherein X is selected from the group consisting of fluoride, chloride, bromide, iodide, sulfate and acetate.

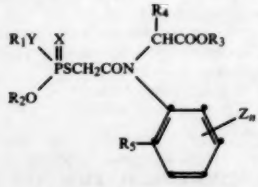
4,394,379

AMIDE PHOSPHOROTHIOLATE DERIVATIVES AND THEIR USE AS PESTICIDES

Osamu Kirino, Ashiya; Masachika Hirano, Ibaraki; Hisami Takeda, and Toshiro Kato, both of Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 58,565, Jul. 18, 1979, abandoned. This application Jan. 17, 1980, Ser. No. 113,133
Claims priority, application Japan, Jul. 21, 1978, 53/89712
Int. Cl.³ A01N 57/14; C07F 9/165, 9/40
U.S. Cl. 424—211 13 Claims

1. A compound of the formula



wherein X is an oxygen or sulfur atom, Y is an oxygen or sulfur atom or imino group, R_1 and R_2, which may be the same or different, are each a C_1–C_3 alkyl group, R_3 is a C_1–C_4 alkyl group, R_4 is a hydrogen atom or methyl group, R_5 is a C_1–C_3 alkyl, methoxy or ethoxy group, Z is a hydrogen atom, a methyl group or chlorine atom and n is 1 or 2.

10. A method for controlling insects, mites, nematodes and/or fungi which comprises contacting the insects, mites, nematodes and/or fungi with an insecticidally, miticidally, nematocidally and/or fungicidally effective amount of at least one amide phosphorothiolate derivative as defined in claim 1.

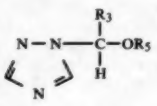
4,394,380

2-(2-ALKOXYALKYL)-1,2,4-TRIAZOLE COMPOUNDS AND THEIR USE AS FUNGICIDES

Sugavanam Balasubramanyan, Wokingham, and Margaret C. Shephard, Maidenhead, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 882,205, Feb. 27, 1978, Pat. No. 4,315,016, which is a continuation-in-part of Ser. No. 720,664, Sep. 7, 1976, abandoned. This application Jul. 24, 1981, Ser. No. 286,552
Claims priority, application United Kingdom, Sep. 10, 1975, 37242/75
The portion of the term of this patent subsequent to Feb. 9, 1999, has been disclaimed.
Int. Cl.³ A01N 43/64; C07D 249/08
U.S. Cl. 424—269 9 Claims

1. A compound of general formula:



wherein R_3 is alkyl having up to 5 carbon atoms, phenyl optionally substituted with one substituent selected from the class consisting of halogen, nitro or alkyl having up to 4 carbon atoms, or benzyl optionally substituted on the α-carbon atom with alkyl having up to 4 carbon atoms, and R_5 is alkyl having up to 5 carbon atoms, alkenyl having up to 5 carbon atoms, or a fungicidal acid salt of such a compound.

7. A method of combating fungal diseases in a plant, said method consisting essentially of the step of applying to the plant, seed of the plant or to the locus of the plant or seed, a fungicidally effective amount of a compound or salt as claimed in claim 1.

4,394,381

METHOD FOR THE RELIEF OF PAIN

George F. Sherrill, Newport Beach, Calif., assignor to George F. and Irene Sherrill 1978 Trust No. 1 and George F. and Irene Sherrill 1978 Trust No. 2, both of Newport Beach, Calif. part interest to each

Continuation-in-part of Ser. No. 29,698, Apr. 13, 1979, Pat. No. 4,267,007, which is a continuation of Ser. No. 781,170, Mar. 25, 1977, abandoned. This application Dec. 8, 1980, Ser. No. 214,563
Int. Cl.³ A61K 31/40, 31/14, 31/505, 31/44
U.S. Cl. 424—274 20 Claims

1. A method for the relief in humans of pain which is susceptible to topical treatment comprising the topical application to the distressed areas of a person of an amount of an anesthetic composition effective to relieve said pain, wherein the composition comprises an effective amount of at least 0.1% captan and an effective amount of surface active quaternary ammonium salt bactericide.

4,394,382
DIHYDROBENZOPYRAN COMPOUNDS AND PHARMACEUTICAL COMPOSITION COMPRISING SAID COMPOUNDS

Masami Shiratsuchi, Musashimurayama; Noboru Shimizu, Higashimurayama; Hiromichi Shigyo, Fuchu; Yoshinori Kyotani, Higashiyamato; Hisashi Kunieda, Higashimurayama; Kiyoshi Kawamura, Tokorozawa; Seiichi Sato; Toshihiro Akashi, both of Higashimurayama; Masahiko Nagakura, Sayama; Naotoshi Sawada, Kawasaki, and Yasumi Uchida, Ichikawa, all of Japan, assignors to Kowa Company, Ltd., Japan

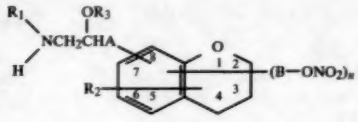
Filed Jun. 9, 1981, Ser. No. 271,927

Claims priority, application Japan, Jun. 17, 1980, 55/80841; Dec. 25, 1980, 55/182854

Int. Cl.³ A61K *31/35;* **C07D** *311/04*

U.S. Cl. 424—283 **3 Claims**

1. A compound represented by the following



(I)

wherein

A represents a direct bond or the bond —CH_2—O—,

R_1 represents a member selected from the group consisting of a C_3–C_5 alkyl group, a hydroxy-(C_3–C_5 alkyl) group, a lower alkylamino-lower alkyl group, a nitrato-(C_3–C_5 alkyl) group and a phenyl-(C_1–C_5) alkyl group, provided that the phenyl may be substituted by a lower alkoxy group,

R_2 represents a member selected from the group consisting of hydrogen, halogen, OH, NO_2, a carbamoyl group, a lower alkyl group, a lower alkoxy group, a lower alkyleneoxy group and an acetyl group,

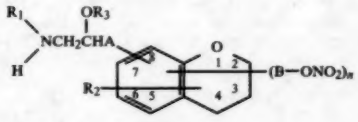
R_3 represents hydrogen or NO_2

B represents a direct bond, a C_1–C_7 alkylene group, a —O—lower alkylene group or a —CONH-lower alkylene group, and

n represents 1 or 2;

and an acid addition salt thereof.

2. A pharmaceutical composition comprising (1) an amount, effective for treatment of diseases of the cardiovascular system, of a compound represented by the following formula (I) or a pharmaceutically acceptable acid addition salt thereof and (2) a pharmaceutically acceptable diluent or carrier,



(I)

wherein

A represents a direct bond or the bond —CH_2—O—,

R_1 represents a member selected from the group consisting of a C_3–C_5 alkyl group, a hydroxy-(C_3–C_5)alkyl group, a lower alkylamino-lower alkyl group, a nitrato-(C_3–C_5 alkyl) group and a phenyl-(C_1–C_5 alkyl) group, provided that the phenyl may be substituted by a lower alkoxy group,

R_2 represents a member selected from the group consisting of hydrogen, halogen, OH, NO_2, a carbamoyl group, a lower alkyl group, a lower alkoxy group, a lower alkyleneoxy group and acetyl group,

R_3 represents hydrogen or NO_2,

B represents a direct bond, a C_1–C_7 alkylene group, a —O—lower alkylene group or a —CONH-lower alkylene group, and

n represents 1 or 2.

4,394,383
N-ALKOXYSULFENYLCARBAMATES USEFUL AS INSECTICIDES

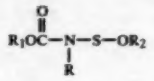
Mitsuyasu Kawata; Noriharu Umetsu, and Tetsuo R. Fukuto, all of Riverside, Calif., assignors to Regents of the University of California, Berkeley, Calif.

Filed Sep. 28, 1981, Ser. No. 306,437

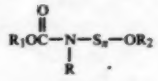
Int. Cl.³ A01N *47/24;* **C07D** *307/86;* **C07C** *161/00*

U.S. Cl. 424—285 **9 Claims**

1. A composition having pesticidal activity comprising about 60 to 95 percent by weight of a carbamate of the formula:



wherein R is a hydrocarbyl group containing from 1 to 12 carbon atoms; R_1 is a hydrocarbyl group containing from 1 to 20 carbon atoms or is a benzoheterocyclic ring containing 5 or 6 members in the heterocyclic portion, said heterocyclic portion containing one or two O or S atoms; and R_2 is a hydrocarbyl group containing only atoms of carbon and hydrogen and from 1 to 24 carbon atoms, or is a substituted hydrocarbyl group of 1-24 carbon atoms containing, in addition to atoms of carbon and hydrogen, at least one other atom; and from about 5 to about 40 percent by weight of a polysulfide derivative of said carbamate of the formula:



wherein n is an integer between 2 and about 4 and the other variables are as above.

4,394,384
AMINOTHIAZOLE CYCLOALKENYLOXYIMINO ACETAMIDO CEPHEM DERIVATIVES

Takao Takaya, Kawanishi; Hisashi Takasugi, Kohamanishi; Masayoshi Murata, Mino, and Akiteru Yoshioka, Kyoto, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

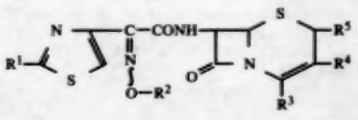
Filed Sep. 2, 1980, Ser. No. 183,167

Claims priority, application United Kingdom, Sep. 3, 1979, 7930515; Jun. 2, 1980, 8018006

Int. Cl.³ A61K *31/545;* **C07D** *501/34, 501/56*

U.S. Cl. 424—246 **11 Claims**

1. A cephem compound of the formula:



wherein

R^1 is amino or a protected amino group;

R^2 is cyclopentenyl or cyclohexenyl;

R^3 is carboxy or a protected carboxy group;

R^4 is a group of the formula:

$-CH_2-R^{4a}$

wherein R^{4a} is lower alkanoyloxy or thiadiazolylthio; and R^5 is hydrogen or lower alkyl; and pharmaceutically acceptable salts thereof.

11. A pharmaceutical composition comprising an effective amount of a compound of claim **1** or pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,394,385

TREATMENT OF GRAY MATTER EDEMA

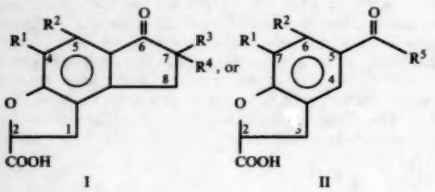
Edward J. Cragoe, Jr., Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 209,187, Nov. 21, 1980, abandoned, which is a continuation of Ser. No. 57,635, Jul. 16, 1979, abandoned, which is a continuation of Ser. No. 879,998, Feb. 22, 1978, abandoned. This application Jan. 29, 1982, Ser. No. 344,148

Int. Cl.³ A61K *31/34*

U.S. Cl. 424—285 **17 Claims**

1. A method of treating persons with gray matter edema which comprises administering to such a person an effective amount of a compound of the formulae:



I II

wherein

R^1 is H, CH_3 or Cl

R^2 is CH_3 or Cl

R^3 is alkyl or alkenyl of one through six carbons; cycloalkyl or cycloalkylalkyl of four through seven carbons; phenyl, unsubstituted or substituted with chloro or methyl; benzyl; or thienyl

R^4 is H, alkyl of one through five carbons, or R^4 and R^3 taken together with the carbon to which they are attached may be joined to form a cycloalkyl radical of five or six carbons, and

R^5 is (1) furyl, (2) thienyl, (3) phenyl, unsubstituted or substituted with methyl, methoxy or halo, or (4) benzyl, unsubstituted or substituted with methyl or halo

or the pharmaceutically acceptable salt, ester, or amide derivative thereof.

4,394,386

FLUORINATED CARBAMATE INSECTICIDES

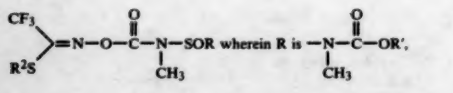
William J. Middleton, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 139,797, Apr. 14, 1980, Pat. No. 4,323,578, which is a continuation-in-part of Ser. No. 65,485, Sep. 10, 1979, abandoned. This application Jan. 11, 1982, Ser. No. 338,474

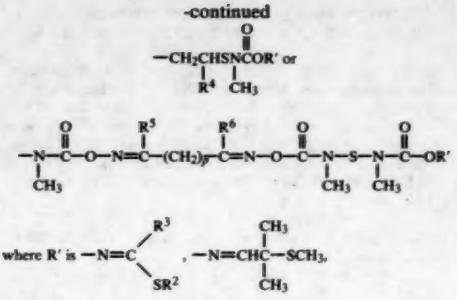
Int. Cl.³ A01N *37/52*; **C07C** *119/18*

U.S. Cl. 424—298 **6 Claims**

1. A compound of the formula:



-continued



where R′ is $-N=C$ (with R^3 and SR^2), $-N=CHC(CH_3)-SCH_3$,

R^2 is C_1–C_6 alkyl; C_3–C_6 alkenyl, or CH_2-(phenyl);

R^3 is CFXY, $CON(CH_3)_2$, CH_2OCH_3, or C_1–C_3 alkyl; wherein X and Y are independently H or F;

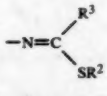
R^4 is H or CH_3;

P_5 is 0, 1 or 2;

R^5 or R^6 are independently H, C_1–C_4 alkyl, phenyl or phenyl substituted with one atom of F, Cl, Br or CH_3;

provided that when:

R^4 is CH_3, R′ must be



and R^3 must be CFXY.

3. An insecticide composition consisting essentially of a surfactant, diluent, and an effective amount of a compound of claim **1**.

4,394,387

COMPOSITIONS AND METHOD OF COMBATTING PEST EMPLOYING SUBSTITUTED BENZOPHENONE HYDROZONES OR SEMICARBAZONES

Leonard G. Copping, Southwell; John C. Kerry, Nottingham; Thomas I. Watkins, Nottingham; Robert J. Willis, Nottingham, and Bryan H. Palmer, Nottingham, all of England, assignors to The Boots Company PLC, Nottingham, England

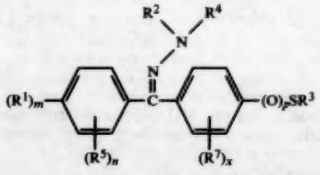
Division of Ser. No. 124,183, Feb. 25, 1980, Pat. No. 4,344,893, which is a continuation-in-part of Ser. No. 15,011, Feb. 26, 1979, abandoned. This application Jul. 2, 1981, Ser. No. 279,918

Claims priority, application United Kingdom, Mar. 1, 1978, 8002/78; Mar. 1, 1978, 8003/78

Int. Cl.³ A01N *41/02, 43/40, 47/10, 47/28*

U.S. Cl. 424—300 **13 Claims**

1. An insecticidal or acaricidal composition comprising an inert carrier and an insecticidally or acaricidally effective amount of a compound of formula I



I

in which m is 0 and n is 0 or m is 1 and n is 0 or 1; p is 0, 2 or

3, x is 0 or 1; R^1, R^5 and R^7 are hydrogen, alkyl, haloalkyl or alkoxy or R^1 and an adjacent R^5 group together with the benzene to which they are attached form a naphthyl group; R^2 and R^4 may be the same or different and are hydrogen; alkyl; an ester group of formula R^8XCO, where X is oxygen or sulphur and R^8 is selected from the group consisting of alkyl (optionally substituted by alkoxy, cycloalkyl, halogen, phenyl, substituted, phenyl, naphthyl, phenoxy or substituted phenoxy), cycloalkyl, alkenyl, (optionally substituted by phenyl or substituted phenyl), alkynyl, phenyl, substituted phenyl, 2-naphthyl, furyl, thienyl, pyridyl, morpholinyl, piperidyl, and thiamorpholinyl; an acyl group of formula R^9CO where R^9 is selected from the group consisting of hydrogen, alkyl, (optionally substituted by alkoxy, cycloalkyl, halogen, phenoxy or substituted phenoxy), cycloalkyl, alkenyl (optionally substituted by phenyl or substituted phenyl), alkynyl, phenyl, substituted phenyl, 2-naphthyl, morpholinyl, piperidyl and thiamorpholinyl; (wherein when one of R^8 or R^9 contains a substituted phenyl group, the phenyl is substituted by one or more groups selected from the group consisting C_{1-4} alkyl, C_{1-4} haloalkyl, nitro, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{1-4} dialkylamino, phenyl and halogen); a carbamoyl group of formula $—CONR^{10}R^{11}$ where R^{10} and R^{11} are the same or different and are hydrogen or alkyl; or R^2 and R^4 together with the nitrogen to which they are attached form the group piperidine, pyrrolidine, thiamorpholine or morpholine; R^3 is alkyl, optionally substituted by halogen; alkenyl; N,N-dialkylamino; or phenol, optionally substituted by alkyl or halogen; with the proviso that when p is 0, R^2 and R^4 are not both hydrogen.

4,394,388

METHOD FOR THE CONTROL OF CATTLE GRUBS EMPLOYING M-PHENOXYBENZYL AND α-CYANO-M-PHENOXYBENZYL ESTERS OF 2-HALOALKYL(OXY-, THIO-, SULFINYL-, OR SULFONYL)PHENYL ALKANOIC ACIDS

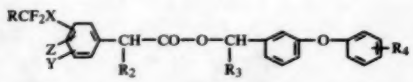
Robert H. Schenkel, Yardley, Pa., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 21, 1981, Ser. No. 295,055

Int. Cl.³ A61K *31/275, 31/235*

U.S. Cl. 424—304 **8 Claims**

1. A method for protecting ruminant, domestic, and farm animals from infestation by the larvae of flies of the family Hypodermatidae comprising, applying topically to larvae-infested animals a larvicidally effective amount of a compound having the structural formula:



wherein RCF_2X—, Y and Z are all meta or para to the carbon to which the alkanoic acid ester group is attached, and X is O, S, SO or SO_2; Y and Z is each H, Cl, F, Br, NO_2, CH_3 or OCH_3; R is H, F, CHF_2 or CF_3; R_2 is ethyl, n-propyl, isopropyl, isopropenyl or t-butyl; R_3 is H, CN or —C≡CH; and R_4 is H, F, Cl, CH_3 or OCH_3 or the optical isomers thereof.

4,394,389

HYDROXYBENZOHYDROXAMIC ACIDS, BENZAMIDES AND ESTERS AS RIBONUCLEOTIDE REDUCTASE INHIBITORS

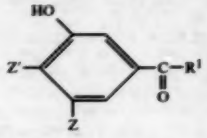
Bartholomeus van't Riet, 3419 Nobel Ave., Richmond, Va. 23222; Howard L. Elford, 3313 Gloucester Rd., Richmond, Va. 23227, and Galen L. Wampler, 6938 Chamberlayne Rd., Mechanicsville, Va. 23111

Continuation-in-part of Ser. No. 16,472, Mar. 1, 1979, Pat. No. 4,263,322. This application Mar. 24, 1981, Ser. No. 247,171

Int. Cl.³ A61K *31/235, 31/185;* **C07C** *103/26, 69/78*

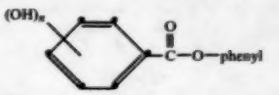
U.S. Cl. 424—308 **10 Claims**

1. A method of inhibiting ribonucleotide reductase which comprises administering to a mammal carrying a tumor having a relatively high ribonucleotide reductase level, an amount of a compound according to the following formula effective to inhibit ribonucleotide reductase



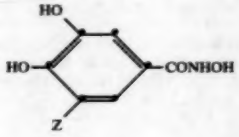
wherein Z and Z' are individually H or OH, at least one of Z and Z' being OH, and R^1 is NHOH or O-phenyl.

6. A compound of the formula



wherein n is 2 or 3.

8. A compound of the formula



wherein Z is H or OH.

4,394,390

NASAL DOSAGE FORMS OF PROPRANOL

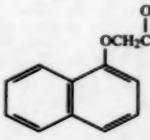
Anwar A. Hussain; Shinichiro Hirai, and Rima Bawarshi, all of Lexington, Ky., assignors to University of Kentucky Research Foundation, Lexington, Ky.

Division of Ser. No. 63,176, Aug. 3, 1979, Pat. No. 4,284,648. This application Oct. 7, 1980, Ser. No. 194,786

Int. Cl.³ A61K *9/06, 31/135;* **C07C** *93/00*

U.S. Cl. 424—330 **11 Claims**

1. A pharmaceutically acceptable nasal composition, in dosage unit form, for nasal administration to obtain a systemic therapeutic β-adrenergic blocking response in a warm-blooded animal, consisting essentially of, per nasal dosage unit, (i) a systemically therapeutically effective unit β-adrenergic blocking amount of a compound having the formula



or a nontoxic pharmaceutically acceptable ester of salt thereof, and (ii) a nontoxic pharmaceutically acceptable nasal carrier therefor, said composition being formulated as a nasal ointment or a nasal gel adapted for sustained release to the nasal mucosa.

11. Propranolol stearate.

4,394,391
RADIOIMMUNOASSAY REAGENTS

Jan I. Thorell, Beleshogsvagen 1, S-21618 Malmo, Sweden

Filed Feb. 19, 1980, Ser. No. 122,212
Int. Cl.[3] A61K *45/00, 47/00;* A01N *25/10*
U.S. Cl. 424—366 11 Claims

1. A composition for separating free and bound radioligands within a radioimmunoassay, said bound radioligand being formed as a reaction product from reagents of the radioimmunoassay; the composition comprising individual particles capable of sedimenting in said assay and containing:

(1) as a first active component, an attenuator having a high capacity to absorb emitted radiation of the radioligand and being selected from the group consisting of silver, cadmium, tungsten, bismuth and oxides thereof, and

(2) as a second active component a material capable of binding said free radioligand or reaction product and being selected from the group consisting of charcoal, antibodies, antigens and biologically non-immune active binders.

4,394,392
PROCESSES FOR PRODUCING COMPOSITE ICE CONFECTIONS, AND PRODUCTS THEREOF

David Tresser, Bedford, England, assignor to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

PCT No. PCT/GB80/00120, § 371 Date Mar. 20, 1981, § 102(e) Date Mar. 17, 1981, PCT Pub. No. WO81/00190, PCT Pub. Date Feb. 5, 1981
PCT Filed Jul. 21, 1980, Ser. No. 244,797
Claims priority, application United Kingdom, Jul. 20, 1979, 7925374; Jul. 20, 1979, 7925375; Jul. 20, 1979, 7925401; Jul. 20, 1979, 7925402; Jul. 20, 1979, 7925447
Int. Cl.[3] A23G *9/04, 9/24*
U.S. Cl. 426—101 14 Claims

1. A process for producing a composite edible product containing a dry edible material selected from the group consisting of biscuits and wafers and a water-containing edible confection selected from the group consisting of ice or ice cream which comprise the steps of:

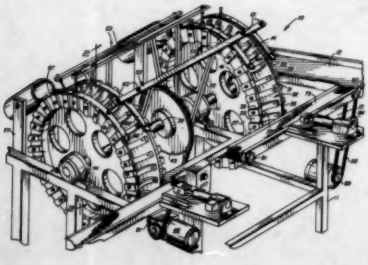
(a) spraying a relatively water-impermeable fat-containing edible material which when measured at 46° C. has a viscosity of η_3 at least 10 poise, η_{100} at least 2.0 poise, and η_{CA} at least 1.2 poise, from an atomizing spray gun onto a dry edible material selected from the group consisting of biscuits and wafers, and

(b) combining the water-containing edible confection with the sprayed dry edible material.

4,394,393
METHOD FOR PEELING CITRUS FRUIT

Paul F. Sage, Box 191-F, Babson Park, Fla. 33827

Division of Ser. No. 141,376, Apr. 18, 1980, Pat. No. 4,318,339.
This application Nov. 23, 1981, Ser. No. 324,380
Int. Cl.[3] G01N *33/02;* A23N *7/00*
U.S. Cl. 426—231 1 Claim



1. A method for removing the peel and albedo from the pulp of citrus fruit comprising the steps of:

coring the fruit;

slicing the fruit into twelve uniform segments;

placing the fruit segments in a conveyor to laterally transport individual fruit segments;

sensing the position of a concave rotary carrier;

pushing the fruit segment into the concave rotary carrier when the rotary carrier is at a predetermined loading position;

confining the fruit segment to a radial position on the concave rotary carrier;

forcing the fruit segment substantially towards the center of the concave rotary carrier so that the peel of the fruit is molded against the concave surface of the concave rotary carrier;

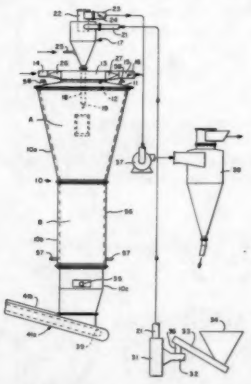
rotating the rotary carrier;

forcing the fruit segment through a pointed concave severing knife having a concave surface substantially the same as the concave surface in the rotary carrier and disposed an incremental distance away from the rotary carrier at least equal to the thickness of the peel and albedo layer of the fruit segment, the severing knife being oriented so as to have a substantial vertical component whereby the pulp will fall from the severing knife by the action of gravity.

4,394,394
PROCESS FOR PRODUCING DRY DISCRETE AGGLOMERATED GARLIC AND ONION AND RESULTING PRODUCTS

Louis J. Nava, Redwood City, and Neal L. Ewing, Livermore, both of Calif., assignors to Foremost-McKesson, Inc., San Francisco, Calif.

Filed Aug. 25, 1980, Ser. No. 180,615
Int. Cl.[3] A23B *7/02;* A23L *1/224, 1/223*
U.S. Cl. 426—285 5 Claims



1. A method for the production of a dry free flowing agglomerated product from dry powder material selected from the group consisting of garlic and onion or combinations thereof, the method making use of an upright structure forming superposed upper and lower treatment chambers that are in free unobstructed communication, the method comprising the steps of dispersing the dry powder in the air stream and continuously introducing the air stream and dispersed powder into the upper portion of the upper chamber, simultaneously introducing atomized water into the upper chamber and causing the dispersed powder particles to be co-mingled with water droplets, the resulting wetting of the powder particles by contact with water droplets causing the particles to become sticky whereby random contacts of the wetted particles in the upper chamber form dispersed moist porous aggregates that are sticky and have little firmness, continuously introducing hot drying air into the lower portion of the lower chamber,

whereby such air progresses upwardly through the lower chamber and upwardly into the upper chamber, the air pressure within both the upper and lower chambers being maintained slightly below atmospheric, and causing the dispersed moist aggregates continuously to progress in free flight downwardly by gravity from the upper chamber into and through the lower chamber whereby sufficient moisture is removed from the dispersed aggregates while progressing through the lower chamber in free flight to render them nonsticky and firm, the aggregates while sticky having minimum contact and adherence with the walls of the chambers, and then subjecting the aggregates to drying to the desired final moisture content.

4,394,395

PROCESS FOR THE PRODUCTION OF A MOLDED FOOD PRODUCT BY SINTERING

Walter Rostagno, La Tour-de-Peilz, and Alfred Morand, Blonay, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Oct. 13, 1981, Ser. No. 310,744

Claims priority, application Switzerland, Oct. 31, 1980, 8114/80

Int. Cl.³ A23P *1/00*; A23C *9/18*; A23F *5/38*; A23G *3/00*

U.S. Cl. 426—285 **8 Claims**

1. A process for the production of a food product in the form on an individual article made from a powder-form starting material comprising the steps of:

(a) introducing a food powder having a particle size of from 0.1 to 3.0 mm and a moisture content of less than 20% by weight into the cells of a mold, said food powder capable of being superficially softened under the effect of heat and having a high level of fluidity;

(b) lightly compacting the food powder in the cells by applying a pressure on the powder of from 1 to 8 kg/cm^2;

(c) subjecting the compacted powder to a sintering treatment in a furnace for 3 to 10 minutes at a product temperature of from 45° to 120° C. such that the individual particles melt at their surface and adhere to one another to form an individual article;

(d) removing the articles from the mold; and then

(e) cooling the articles.

4,394,396

SHRIMP PROCESSING

Lawrence A. Shimp, Robbinsville, N.J., and John E. Steinhauer, Malvern, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 9, 1981, Ser. No. 309,873

Int. Cl.³ A23L *1/325*

U.S. Cl. 426—332 **6 Claims**

1. A process for inhibiting the loss of moisture of raw shrimp on thawing or cooking while retaining their natural appearance after processing comprising contacting the shrimp with an aqueous solution of a phosphate salt mixture of sodium tripolyphosphate and sodium acid pyrophosphate, said salts being present in a weight ratio of 80:20 to 60:40, the pH of said solution being about 6.2 to 7.1, the concentration of said salt mixture in the solution being 0.5 wt % to saturation.

4,394,397

PROCESS FOR PRODUCING PASTA PRODUCTS

Josephine E. Lometillo, Sepulveda, and John M. Wolcott, Burbank, both of Calif., assignors to Carnation Company, Los Angeles, Calif.

Filed Oct. 2, 1981, Ser. No. 308,071

Int. Cl.³ A23L *1/16*

U.S. Cl. 426—557 **11 Claims**

1. A process of producing instant cooking pasta products having a porous, cellular structure which consists essentially of forming a particulate mixture containing a major proportion by weight of a farinaceous starch-containing material, from 1% to 26% by weight of gluten, from 0.25% to 0.75% by weight of microcrystalline cellulose, between 1% to 3.5% by weight of an edible vegetable oil, and from 0%-less than 2% of a phosphatide,

introducing the particulate mixture into an extrusion cooker together with an amount of water sufficient to provide an expandable mixture capable of being carried through the extrusion cooker,

subjecting said expandable mixture to severe mechanical working under temperatures sufficiently high to cook the mixture, thereby gelatinizing the starch and thermosetting the gluten contained therein, and pressure sufficiently high that the pressure drop across the die orifice will result in flashing off of water in the mixture as steam,

extruding the hot, pressurized mixture through a plurality of die orifices into atmospheric conditions, thereby expanding the cooked material by flashing of contained water to steam, and

drying the extruded product to a maximum moisture content of about 10%, thereby producing an expanded product having a porous cellular structure which may be hydrated for consumption by contact with hot water for a short period of time and which upon hydration has a firm texture and good integrity without becoming pasty or sticky.

4,394,398

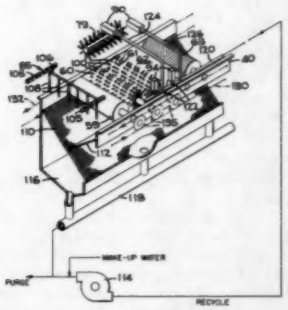
METHOD FOR REMOVING ROT FROM POTATOES

Donald C. Wilson, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 149,791, May 14, 1980, abandoned. This application Dec. 14, 1981, Ser. No. 331,092

Int. Cl.³ A23L *1/216*

U.S. Cl. 426—481 **12 Claims**



6. A method for removing the decayed peel and decayed flesh portions from the skin and underlying sound portions of a potato with apparatus including potato supporting means and a plurality of rubber fingers consisting essentially of: the steps of supporting the potato, contacting substantially all portions of the surface of the potato with the fingers with sufficient force to crack the skin encompassing the decayed portions and to penetrate the decayed portions of the potato surface without damaging the peel or flesh of sound portions of the potato, and directing streams of liquid against substantially all portions of the surface of the potato at a sufficient pressure for washing the potato and for forcing liquid through cracks and underneath the decayed peel for lifting the decayed peel and removing the decayed flesh while removing a minimum of sound peel and sound flesh of the potato.

4,394,399

LOW CALORIE TABLE SYRUP PRODUCT

William L. Keyser, East Dundee, and Diane S. Kinney, St. Charles, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Jun. 25, 1981, Ser. No. 277,173
Int. Cl.³ A23L 1/09
U.S. Cl. 426—658 4 Claims

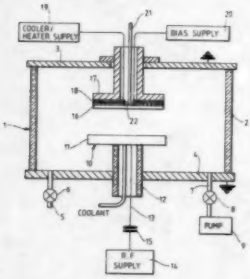
1. An edible, fluid, fat-free syrup composition for use as a table syrup containing not more than 60 calories per fluid ounce consisting essentially of water and not more than 43.3% by weight of the composition sugar solids, 0.5 to 1.0% by weight of the composition a medium viscosity carboxymethyl cellulose gum having a high degree of carboxymethyl substitution or a derivative thereof, 0.1 to 1.0% by weight of the composition salt, 0.01 to 0.5% by weight of the composition an edible anti-mycotic agent, 0.01 to 0.10% by weight of the composition sodium hexametaphosphate, and 0.01 to 0.5% by weight of the composition a flavorant.

4,394,400

METHOD AND APPARATUS FOR DEPOSITING COATINGS IN A GLOW DISCHARGE

Geoffrey W. Green, Malvern, and Alan H. Lettington, Worcester, both of England, assignors to National Research Development Corporation, London, England

Filed Jan. 13, 1981, Ser. No. 224,825
Claims priority, application United Kingdom, Jan. 16, 1980, 8001383
Int. Cl.³ B05C 3/02; C23C 11/00
U.S. Cl. 427—38 12 Claims



1. A method of depositing a coating on a substrate, comprising the steps of:

providing a plasma containing ions of material to be deposited as a coating in a chamber having a cathode structure,

arranging the substrate in the plasma between the anode and cathode structures and electrically separated therefrom, said substrate surface being shaded from a direct stream of positively charged ions from the anode structure toward the cathode structure and spaced from the cathode structure to receive neutral ions of the coating material directly from the cathode structure, and

controlling the substrate temperature independently of the plasma temperature, the arrangement being such that positively charged ions of coating material in the plasma are attracted to and strike the cathode structure and a significant number of atoms of coating material leave the cathode structure and strike the substrate to form the coating.

2. Apparatus for depositing a coating on a substrate comprising:

a vacuum tight chamber,

a pump for providing a vacuum within the chamber,

means for introducing a gas within the chamber,

means including an anode and a cathode structure within the chamber for establishing a plasma including ions of material to be coated on said substrate within the chamber,

means for supporting said substrate in the plasma between the anode and cathode structures and electrically separated therefrom said substrate surface being shaded from the direct stream of positively charged ions from the anode towards the cathode structure and spaced a predetermined distance from the cathode to receive neutral ions directly from the cathode structure

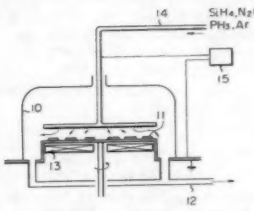
means for controlling the temperature of the substrate independently of the temperature of the plasma, anode structure and cathode structure, the arrangement being such that a plasma may be formed in the chamber so that ions of the coating material will strike the cathode and a significant number of atoms leave the cathode to strike the substrate and form the required coating.

4,394,401

METHOD OF PLASMA ENHANCED CHEMICAL VAPOR DEPOSITION OF PHOSPHOSILICATE GLASS FILM

Yoshimi Shioya, Yokohama; Mamoru Maeda, Tama; Kanetake Takasaki, Tokyo, and Mikio Takagi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 7, 1981, Ser. No. 290,978
Claims priority, application Japan, Aug. 8, 1980, 55-108164
Int. Cl.³ H01L 21/316
U.S. Cl. 427—39 10 Claims



1. A method of plasma enhanced chemical vapor deposition of a phosphosilicate glass film on a substrate comprising the step of exposing the substrate to a reaction gas mixture including SiH_4, N_2O and PH_3, said deposition being effected under conditions such that the reaction gas mixture has a mol ratio of N_2O to SiH_4 (N_2O/SiH_4) which is greater than or equal to 50 and a mol ratio of PH_3 to SiH_4 (PH_3/SiH_4) which is less than or equal to 0.08.

4,394,402

PROCESS FOR TREATING ACETYLENE POLYMER OR DOPED ACETYLENE POLYMER

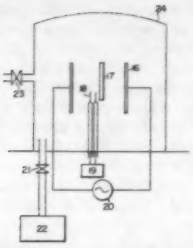
Naoshi Yasuta, Yokohama; Yoshio Matsumura, Yamato, and Teizo Kotani, Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed May 19, 1981, Ser. No. 265,186
Claims priority, application Japan, May 21, 1980, 55-66555
Int. Cl.³ B05D 3/06
U.S. Cl. 427—40 11 Claims

1. A process for treating an acetylene polymer or a doped acetylene polymer, which comprises:

plasma polymerizing a gasifiable organic compound under

reduced pressure by plasma excitation of said organic compound; and



depositing a polymer film on a solid surface of the acetylene or doped acetylene polymer positioned in said polymerization reaction system.

4,394,403

PHOTOPOLYMERIZABLE COMPOSITIONS

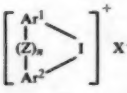
George H. Smith, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 467,899, May 8, 1974, abandoned. This application Apr. 2, 1975, Ser. No. 564,421
Int. Cl.³ G03C *1/68*; C08F *8/18*; B05D *3/06*
U.S. Cl. 427—42 41 Claims

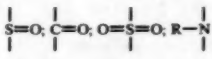
1. A photopolymerizable composition comprising:

(a) an organic material which is cationically polymerizable; and

(b) about 0.5 to 30 parts by weight, per 100 parts by weight of said organic material, of an aromatic iodonium complex salt photoinitiator of the formula



wherein Ar^1 and Ar^2 are aromatic groups having 4 to 20 carbon atoms and are selected from the group consisting of phenyl, thienyl, furanyl, and pyrazolyl groups; Z is selected from the group consisting of an oxygen atom; a sulfur atom;



where R is hydrogen, lower alkyl or acyl; a carbon-to-carbon bond; or

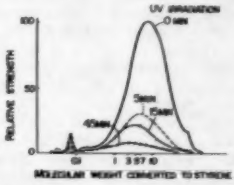
where R_1 and R_2 are selected from the group consisting of hydrogen, an alkyl radical having 1 to 4 carbon atoms, and an alkenyl radical having 2 to 4 carbon atoms; and n is zero or 1; and X^- is a halogen-containing complex anion selected from the group consisting of tetrafluoroborate, hexafluorophosphate, hexafluoroarsenate, hexachloroantimonate, and hexafluoroantimonate.

4,394,404

METHOD FOR PRODUCING MAGNETIC RECORDING MEDIUM

Yoshihisa Suzuki; Takanoli Kaizuka; Yoshiaki Hanyu; Mituyoshi Otake, and Yoichi Hidano, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 118,742, Feb. 5, 1980, Pat. No. 4,313,969. This application Aug. 17, 1981, Ser. No. 293,090
Claims priority, application Japan, Feb. 9, 1979, 54-13349
Int. Cl.³ H01F *10/02*
U.S. Cl. 427—48 13 Claims



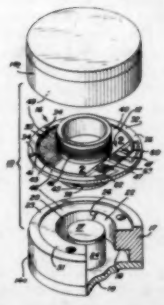
1. In a process for producing a magnetic recording medium comprising the steps of dispersing magnetic particles in a binder and a solvent, coating the resulting magnetic particles dispersion on a flexible support, orienting the magnetic particles, drying the magnetic particles dispersion at a high temperature to prepare a magnetic layer, smoothing the surface of the magnetic layer and slitting the resulting flexible support, the improvement which comprises irradiating the magnetic particles dispersion or the magnetic layer with ultraviolet rays at the step of coating the magnetic particles dispersion or after the coating step to form a layer which prevents the oozing out of a substance from the magnetic layer which causes sticking trouble, said layer which prevents the oozing out of a substance from the magnetic layer being derived from some of said binder and being formed on the surface of the magnetic layer, whereby sticking trouble during use of said magnetic recording medium is substantially prevented.

4,394,405

METHOD OF MAKING FORCE TRANSDUCER FLEXURE

Kim W. Atherton, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jul. 14, 1981, Ser. No. 283,130
Int. Cl.³ B05D *5/12*
U.S. Cl. 427—58 32 Claims



1. A method of manufacturing a flexure for use in connecting a force sensing element to a mounting base in a force transducer comprising:

providing a blank with two opposed surfaces;

removing material from a first portion and a first indicator portion of one of said surfaces;

removing material from a second indicator portion in the other of said surfaces wherein at least a portion of said indicator portion is directly opposite from said first indicator portion; and

discontinuing removal of material from said first portion when at least a portion of the material of said blank between said first and second indicator portions disappears such that at least a portion of said indicator portion surfaces meet.

12. In the manufacture of a force transducer having a movable element hinged to a base by a bendable flexure, the movable element having an electrical circuit component thereon, the improved method of forming the flexure section, comprising:

providing a transducer blank having a flexure section with parallel faces generally at right angles to the sensitive axis of the movable element; and

removing material from a portion of at least one face of said flexure section to form a conductor receiving channel, the bottom surface of such channel lying substantially in the neutral bending plane of said flexure section.

18. The flexure forming method of claim **12** including the step of applying a conductor on the bottom surface of each of said channels and extending from said base to said movable element.

4,394,406

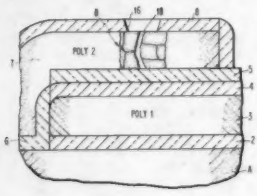
DOUBLE POLYSILICON CONTACT STRUCTURE AND PROCESS

James R Gardiner, Wappingers Falls; Stanley R. Makarewicz, New Windsor; Martin Revitz, Poughkeepsie, and Joseph F. Shepard, Hopewell Junction, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,647

Int. Cl.³ H01L *21/36*

U.S. Cl. 427—86 **1 Claim**



1. A process for fabricating a contact structure for a semiconductor device including at least two superimposed polysilicon conductors comprising the steps of:

A. forming a first insulating layer **2** (FIG. **3**) on a semiconductor substrate A to a preselected thickness, said insulating layer **2** being formed of silicon dioxide and having a thickness in the order of 300 to 700 Å,

B. forming a first conductive polysilicon layer **3** (FIG. **3**) on the first insulating layer **2**, said polysilicon layer **3** having a thickness in the order of 3000 Å to 5000 Å,

C. forming a first dielectric layer **4** (FIG. **4**) on the first conductive polysilicon layer **3**, said first dielectric layer **4** being formed of silicon dioxide and having a thickness in the order of 1000 Å to 4000 Å,

D. patterning the first insulating **2** and dielectric **4** and conductive polysilicon layers **3** into a preselected shape (FIG. **5**),

E. patterning a second dielectric layer **5** (FIG. **5**) on the first dielectric layer as an etch barrier to selected etchants, said second dielectric layer **5** being selected from the group consisting of silicon nitride and aluminum oxide, said second dielectric layer **5** having a thickness in the order of 200 to 1000 Å,

F. forming a second conductive polysilicon layer **7** (FIG. **7**) on the second dielectric layer **5** and superimposed, in part at least, on the first conductive polysilicon layer **3**, said second polysilicon layer **7** having a thickness in the order of 3000 to 5000 Å,

G. forming a third dielectric layer **8** (FIG. **7**) on the second conductive polysilicon layer **7**, said third dielectric layer **8** being formed of silicon dioxide and having a thickness in the order of 1000 to 2000 Å,

H. etching a contact opening **16'** (FIG. **9**) in the third dielectric **8** to expose the second conductive polysilicon layer **7** overlying the first conductive polysilicon layer **3** whereby the second dielectric layer **5** prevents the etchant from exposing the first conductive polysilicon layer **3** by way of voids existing in the second conductive polysilicon layer **7** due to enlarged polysilicon grains, and

I. forming a metal contact **12'** in the opening **16'** (FIG. **9**), whereby the second dielectric layer **5** prevents the etchant from attacking the first dielectric layer **4** overlying the first conductive polysilicon layer **3** and exposing the surface of the first polysilicon layer **3** to the metal **12** thereby physically joining together the first and second conductive polysilicon layers **3**, **7**.

4,394,407

METHOD FOR THE MANUFACTURE OF A LAYER FROM A THERMOCHROME LACQUER, AND ITS USE

Eva Blazso, Baar, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

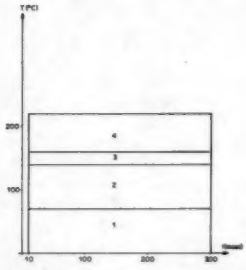
PCT No. PCT/CH80/00039, § 371 Date Feb. 12, 1981, § 102(e) Date Feb. 12, 1981, PCT Pub. No. WO81/00084, PCT Pub. Date Jan. 22, 1981

PCT Filed Mar. 21, 1980, Ser. No. 233,783

Claims priority, application Switzerland, Jun. 27, 1979, 5987/79

Int. Cl.³ B41M *3/12*

U.S. Cl. 427—150 **6 Claims**



1. In a method of coating a smooth surface with a thermochromic, water-resistant layer, with the aid of two reaction components being substantially free of any water and storable separately, and with the aid of a film-forming component and a hardener,

one reaction component being an organic sulfur compound splitting off sulfur in ionized form only upon being heated above 70° C., and thereby assuming a dark discoloration,

the other reaction component being a metal compound produced with the aid of a resin base selected from the group consisting of a methacrylic acid dissolved in aromatic solution means and a compound containing epoxy groups said metal compound being selected from the group consisting of an oxide, an inorganic salt, or a soap of a monocarboxylic acid wih 2, 8, 10, 12, 14, 16, 18, 20, 22 or 38 C-atoms, or a dicarboxylic acid metal compound wherein the metal is selected from the group consisting of bismuth, copper, silver, gold, mercury, thallium, lead,

vanadium, molybdenum, tungsten, rhenium, iron, cobalt, nickel, palladium, or platinum,

the steps comprising:

dispersing said metal compound in said resin base,

mixing said reaction components with said film-forming component and said hardener to yield a multi-component substantially transparent resin, suitable of being used for screen printing, thereby setting off an exothermal reaction generating a temperature not higher than about 40° C., and

applying said multi-component resin to said surface and allowing it to harden thereon at room temperature for at least 30 minutes, whereby said multicomponent resin is hardened to a substantially bone-dry state.

4,394,408

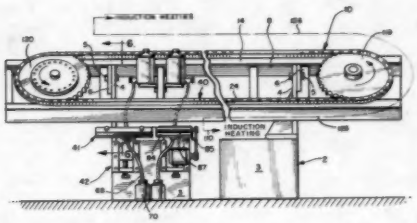
APPARATUS AND METHOD FOR APPLYING ADHESIVE TO A CONTAINER EDGE PORTION

John Walter, Evergreen Park, Ill.; Donald J. Roth, Westport, Conn., and Charles S. Kubis, Willowbrook, Ill., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Mar. 8, 1982, Ser. No. 355,500

Int. Cl.³ B05C *3/20, 7/00;* **B05D** *3/12, 7/22*

U.S. Cl. 427—231 **13 Claims**



1. Apparatus for applying adhesive to the free edge of an open ended can comprising:

means for moving and rotating the can in a predetermined path;

an adhesive dip tank disposed along said path containing adhesive having a top surface, and

means for holding the can at an acute angle to the said top surface of the adhesive and immersing a section of the edge of the can into the adhesive while said can is rotated and moved in said path.

4,394,409

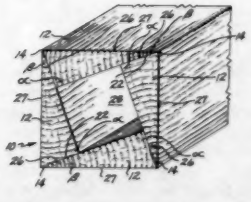
COMPOSITE WOOD ARTICLE AND METHOD OF MANUFACTURE

James E. Hertel, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 835,944, Sep. 22, 1977, abandoned. This application Mar. 23, 1981, Ser. No. 246,924

Int. Cl.³ E04C *3/30;* **F16L** *9/00;* **B32B** *31/00;* **B27B** *1/00*

U.S. Cl. 428—36 **4 Claims**



1. An elongated wood article comprising:

a plurality of four elongated triangular-shaped pieces joined together into the cross-sectional shape of a parallelogram and with at least two pairs of two opposed pieces being substantially similar in cross-sectional size,

said triangular-shaped pieces being joined together along elongated joints, each piece being joined to two adjacent pieces with one surface thereof being joined over its entire surface and the other surface thereof being joined over less than a whole portion of its surface thereby resulting in an elongated hollow section in the article.

4,394,410

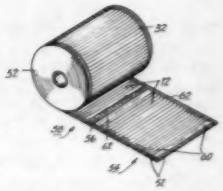
DISPOSABLE FOIL BROILING SHEET

Harold Osrow, and Armando A. Araujo, both of New York, N.Y., assignors to Osrow Products Company, Inc., Old Bethpage, N.Y.

Continuation-in-part of Ser. No. 121,140, Feb. 13, 1980, abandoned. This application Aug. 6, 1981, Ser. No. 290,603

Int. Cl.³ B32B *3/24, 3/28, 15/04*

U.S. Cl. 428—43 **7 Claims**



1. A tripartite, laminate, generally flat, self-form-maintaining, thin, cooking, rectangular, sheet element comprising:

(A) a generally flat, foraminous, rectangular, upper layer composed of non-combustible, impermeable, malleable aluminum foil,

(B) a generally flat, continuous, rectangular, central core layer composed of a dry bibulous material capable of absorbing hot liquid fat, and

(C) a generally flat, rectangular, lower, imperforate layer composed of non-combustible, impermeable, malleable aluminum foil coextensive and in registry with the upper layer, whereby rendered fat from a fat-containing comestible being broiled in a broiling chamber while resting on said element will drain through the foramina in said upper foil layer, to be absorbed in said core layer, trapped by said lower foil layer and contained between said upper and lower foil layers, so that spattering of the rendered fat in the chamber will be reduced,

(D) said upper and lower layers extending peripherally beyond the boundaries of the core layer and being peripherally sealed together by continuous seams to form a peripheral margin having a thickness not in excess of 4 mils,

(E) the periphery of said tripartite element being sufficiently deformable to be manually bendable with great ease and to be pinched together at the corners of the rectangular element to form peripheral flanges on all edges of the cooking sheet, which flanges are self-form-maintaining so that the element can be formed into the shape of a shallow pan,

(F) the thickness of each of the foil layers being between ¼ mils and 2 mils,

(G) the sizes of the foramina ranging between 1/64" and ¼" across.

4,394,411
STRUCTURAL PANEL OF GYPSUM WITH TEXTILE CASING AND METHOD FOR PRODUCING SAME

Manfred Krüll, Heiligkreuzsteinach; Udo Lobert, Neuenburg; Dieter Stamm, Heidelberg, and Klaus Veeser, Müllheim, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

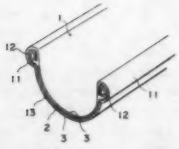
Filed Mar. 8, 1982, Ser. No. 355,698
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113682
Int. Cl.³ B32B *1/04, 31/18*
U.S. Cl. 428—70 8 Claims

1. A structural panel comprising gypsum within an enclosure of a mineral and/or fiberglass fabric impressed therein, said fabric having larger pores on the inside facing said gypsum and containing at least two kinds of fibers, with fibers on the inside of the fabric facing the gypsum being of relatively larger diameter than the other fibers in the fabric, and said fibers of said fabric being cemented together by a bonding agent containing from about 30 to about 85 percent by weight, referred to the weight of the bonding agent, of a hydroxide of aluminum, iron and/or silicon.

4,394,412
COMPOSITE MEMBER COMPRISING METALLIC SHEET BENT TO BE ARCUATE IN SECTION AND RIGID SYNTHETIC RESIN COATING

Hideomi Yamamoto; Haruzo Watanabe, both of Shiga; Hidehiko Kishie, Shijonawate, and Toshio Nishihara, Shiga, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed May 8, 1981, Ser. No. 261,924
Claims priority, application Japan, Mar. 31, 1981, 56-48768
Int. Cl.³ B32B *1/00, 3/00*
U.S. Cl. 428—174 5 Claims



1. A composite member bent to be arcuate in transversal section, comprising:

a metallic sheet bent to be arcuate in transversal section with respect to a first center of curvature and formed with a plurality of small arcuate sectional protuberances extending in the longitudinal direction and distributed only in the transversal direction, each of said small arcuate sectional protuberance being curved with respect to a second center of curvature,

said first center of curvature and each said second center of curvature being selected to be positioned on the same side with respect to said metallic sheet, and

a rigid synthetic resin layer covering both main surfaces of said metallic sheet, said composite member being formed in a length,

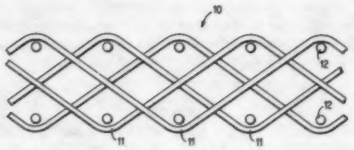
the length of said metallic sheet being selected to be substantially the same as the length of said length of the composite member, and

said plurality of small arcuate sectional protuberances being formed as protuberances extending continuously throughout the length of said metallic sheet.

4,394,413
FLAME RETARDANT DRYER FABRICS

William T. Westhead, Waycross, Ga., assignor to Scapa Dryers, Inc., Waycross, Ga.

Filed Feb. 9, 1981, Ser. No. 232,678
Int. Cl.³ B32B *7/00*
U.S. Cl. 428—257 24 Claims



1. A flame retardant dryer fabric comprising:

a plurality of interwoven machine direction and cross-machine direction yarns; and

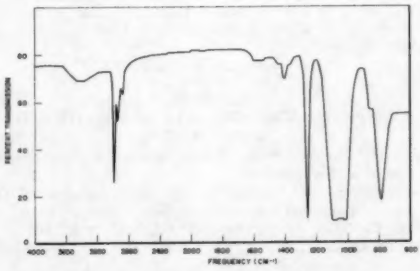
an admixture of resin and flame retardant coating said machine direction and cross-machine direction yarns,

said resin being chosen for its known ability to provide fabric stability, wear and abrasion resistance, heat and hydrolysis resistance, resistance to chemical attack, modulus, and oil and dirt resistance; said flame retardant being compatible with said resin; and said admixture being free of nucleation and being an integral part of said fabric.

4,394,414
AQUEOUS SIZING COMPOSITION FOR GLASS FIBERS FOR USE ON CHOPPED GLASS FIBERS

Daniel G. Brown, Caroleen, and Donald L. Motsinger, Forest City, both of N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 29, 1981, Ser. No. 268,541
Int. Cl.³ D04H *1/58;* C08L *83/06*
U.S. Cl. 428—288 21 Claims



1. An aqueous sizing composition for glass fibers, comprising:

a. one or more cationic lubricants,

b. water soluble or dispersible amide selected from the group consisting of monoamides, diamides, melamine, diamides of saturated dicarboxylic acids, carbamides, non-polymeric amine-containing amides and mixtures thereof,

c. curable silicone polymer in a cationic aqueous emulsion; and

d. water in an amount to give a solids content in the range of about 0.1 to about 5 weight percent wherein the major amount of the solids of the sizing composition is comprised of cationic lubricant and emulsion.

4,394,415

ELECTROMAGNETIC WAVE ENERGY ABSORBING MATERIAL

Shunji Tsuda, 12-12-604 Nishi-kamata, 7-chome, Ota-ku, Tokyo, Japan

Filed Jun. 21, 1982, Ser. No. 390,192
Claims priority, application Japan, Aug. 5, 1981, 56-122711
Int. Cl.³ B32B 15/04, 15/20, 7/02
U.S. Cl. 428—332 4 Claims

1. An electromagnetic wave energy absorbing material comprising an aluminum material having a microporous aluminum oxide layer having a thickness of 0.1–1.4 micron on its surface, wherein 0.05–1.5 g/m² of at least one of elements of metals and semiconductors selected from the group consisting of cobalt, silver, lead, molybdenum, copper, chromium, selenium, silicon, germanium, iron, manganese, nickel, zinc, tin and palladium is contained in the micropores of the microporous aluminum oxide layer.

4,394,416

FILM-PAPER FIBER LAYER LAMINATE AND PROCESS FOR PREPARATION THEREOF

Yoshikazu Shimizu, Amagasaki, and Kathuhiro Yamaguchi, Osaka, both of Japan, assignors to Azona Co., Ltd., Kobe, Japan

Division of Ser. No. 213,642, Dec. 5, 1980, abandoned. This application May 26, 1981, Ser. No. 267,380
Claims priority, application Japan, Dec. 12, 1979, 54-161150
Int. Cl.³ B32B 27/10, 27/28
U.S. Cl. 428—341 3 Claims

1. A film-paper fiber layer laminate comprising a film selected from the group consisting of a polyvinyl chloride film, a polyethylene film, a polypropylene film, a polystyrene film, a polyacetate film, a polycarbonate film, a polyester film, a polyamide film, a polyimide film and a chlorinated rubber film; and a thin paper fiber layer bonded to the film, the basis weight of the paper fiber layer being 5 to 15 g/m².

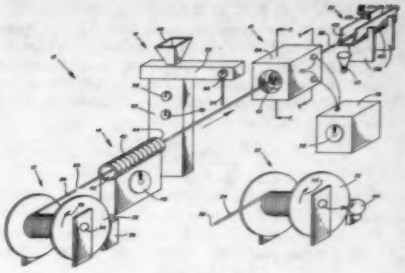
4,394,417

MAGNET WIRE

George D. Hilker, Fort Wayne, Ind., assignor to Phelps Dodge Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 931,314, Aug. 7, 1978. This application Apr. 20, 1981, Ser. No. 255,473
Int. Cl.³ B32B 27/00
U.S. Cl. 428—383 7 Claims

1. A magnet wire or other coated filament comprising: an elongated filament and an essentially concentric and continuous coating superimposed on said filament, said coating being chosen from the group of materials consisting of polyamides, polycarbonates, polysulfones, epoxys, polyether imides, polyether ether ketones and polyesters, said coating being applied to a desired thickness in a single pass, said thickness meeting



the requirements of ANSI/NEMA Standards Publication No. MW1000-1977.

4,394,418

AQUEOUS SIZING COMPOSITION AND GLASS FIBERS MADE THEREWITH FOR REINFORCING THERMOSETTING POLYMERS

Chester S. Temple, McKees Rocks, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 24, 1981, Ser. No. 334,349
Int. Cl.³ B32B 9/00
U.S. Cl. 428—391 36 Claims

1. An aqueous sizing composition for glass fibers to yield sized glass fiber strands useful in reinforcing thermosetting polymers, comprising:

(a) poly(vinylacetate) silane copolymer,
(b) epoxy polymer,
(c) one or more glass fiber lubricants,
(d) an organo silane coupling agent selected from the group consisting of amino-organo-silane coupling agents, lubricant modified amino-organo-silane coupling agents, epoxy-containing silane coupling agents and a mixture of two or more of these agents,
(e) one or more nonionic surfactants,
(f) polyethylene-containing polymer in an amount of 0 to about 25 weight percent of the solids of the aqueous sizing composition,
(g) wax in an amount of about 0 to about 5 weight percent of the solids of the aqueous sizing composition where an amount of the polyethylene-containing polymer is present when the wax is absent and an amount of wax is present if the polyethylene-containing polymer is absent and when both are present, the weight ratio of the polyethylene-containing polymer to wax is in the range of about 25:1 to about 1:25,
(h) organic hydrocarbon acid to give the composition a pH in the range of about 4 to about 9, and
(i) water to give a total solids content in the range of about 1 to about 30 weight percent.

4,394,419

PRINTED CIRCUIT MATERIAL

Jiri K. Konicek, Bennington, Vt., assignor to Oak Industries Inc., Rancho Bernardo, Calif.

Filed Jun. 12, 1981, Ser. No. 272,988
Int. Cl.³ C23F 1/00; C25D 5/10
U.S. Cl. 428—416 10 Claims

1. A product useful in the manufacture of printed circuits including,

(a) a carrier layer of copper fully removable by etching and having a thickness on the order of about 10–35 microns,
(b) a thin layer of copper having a thickness in the range of

1–12 microns to be used in the formation of electrical circuit paths, and

(c) an intermediate metallic layer positioned between the (a) and (b) layers and secured thereto, said intermediate layer having a thickness in the range of 0.1–2.0 microns and being selected from the group consisting of nickel, a nickel-tin alloy, a nickel-iron alloy, lead, and a tin-lead alloy, said intermediate layer adhering sufficiently to the (b) layer of copper to prevent removal thereof by an etchant removing the (a) layer of copper.

4,394,420

MAGNETIC RECORDING MEDIUM

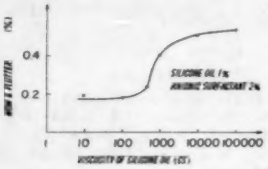
Kiminori Tamai, and Masashi Hayama, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1981, Ser. No. 316,407

Claims priority, application Japan, Nov. 19, 1980, 55-163056

Int. Cl.³ B32B 9/04

U.S. Cl. 428—447 **1 Claim**



1. In a magnetic recording medium having a magnetic layer which comprises a magnetic powder, a binder and a nonionic or anionic surfactant in an amount of 1.0 to 5.0 wt. % based on said magnetic powder, the improvement comprising within said magnetic layer of 0.5 to 5.0 wt. % based on said binder of a silicone oil of the formula

$$(CH_3)_3SiO\left(\begin{matrix}CH_3\\|\\Si-O\\|\\CH_3\end{matrix}\right)_n Si(CH_3)_3$$

where n is a value such that the viscosity of the silicone oil is 500 c.s. or lower at 25° C., whereby the blooming of the surfactant and the plasticization of the magnetic layer are diminished.

4,394,421

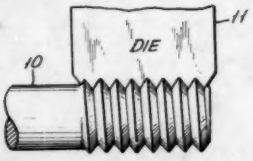
THREAD FORMING OF SINTERED POROUS METAL SHAPES

William J. Chmura, Southington, and Ronald S. Slusarski, Berlin, both of Conn., assignors to Textron Inc., Providence, R.I.

Continuation of Ser. No. 55,508, Jul. 9, 1979, abandoned. This application Feb. 18, 1981, Ser. No. 235,641

Int. Cl.³ B21H 3/04; B22F 3/24, 5/06; B32B 5/14

U.S. Cl. 428—547 **16 Claims**



1. A method of producing a thread rolled sintered cylindrical metal product which comprises:

forming a sintered cylindrical powder metal (P/M) blank of density ranging from about 75% to 92% of the actual density of said metal having a selected diameter larger than the final pitch diameter of a predetermined roll threaded product produced therefrom and not exceeding the outside diameter of said predetermined roll threaded product,

the P/M blank diameter selected being substantially inversely related to the density of said blank, the P/M diameter selected being correlated to produce a substantially full thread,

and then thread rolling said sintered P/M blank using a threading die of the same thread gage as the predetermined roll threaded product to be produced,

whereby a thread rolled P/M product is produced having a porous core and highly densified threads, the density of the threads at the surface and sub-surface thereof from the root to the crest being at least about 95% of the actual density, with the density of the core ranging from about 75% to 92% of the actual density of the metal forming the product.

4,394,422

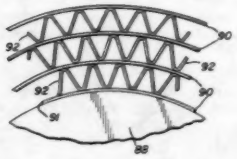
BONDED STRUCTURE AND PROCESS OF MAKING SAME

Ray J. Van Thyne, 1070 Valley Lake Dr., Inverness, Ill. 60067, and John J. Rausch, Rte. 2, Box 177, Antioch, Ill. 60002, assignors to Ray J. Van Thyne; John J. Rausch and Material Sciences Corporation, all of Mount Prospect, Ill.

Filed Jun. 8, 1981, Ser. No. 271,127

Int. Cl.³ B32B 3/28; C23C 9/00

U.S. Cl. 428—592 **24 Claims**



A bonded structure comprising at least two adjacent ferrous-based components having a layer diffused in the surface of both of said parts to bond them, together, wherein both of said components are sheets of ferrous-based material and at least one of said sheets has spacer means bonded to the other of said sheets to create at least one channel therebetween, said bonded structure being made by the steps of placing said components in juxtaposition, and contacting said juxtaposed components with a molten alloy bath consisting essentially of lead and at least one diffusing element, thereby to create a layer diffused into the surfaces of both of said components which bonds them together.

4,394,423

CLOSURE DEVICE FOR LEAD-ACID BATTERIES

Konstantin Ledjeff, Schwalbach, Fed. Rep. of Germany (granted to U.S. Department of Energy under the provisions of 42 U.S.C. 2182)

Filed Sep. 29, 1981, Ser. No. 307,000

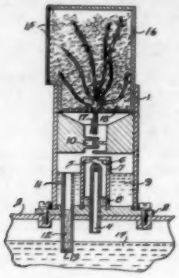
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1980, 3045480

Int. Cl.³ H01M 2/12

U.S. Cl. 429—86 **4 Claims**

1. A closure device for attaching to a lead-acid battery for removing poisons from gases produced and discharged during battery use, comprising the combination of a filter of activated carbon and means for preventing explosion, said means for preventing explosion comprises a nozzle having an inlet communicating with a passageway from said battery and a constricted discharge for gases directed towards an impingement surface, a closed-end tube disposed around said nozzle and having a closed end forming said impingement surface, said closed-end tube having a side-wall opening for gas discharge at

an end portion opposite to said impingement surface and an open-end vertical tube outside said closed-end tube, said open-end tube having an open upper end at a level above said side wall openings in said closed-end tube but below said constricted discharge of said nozzle and below said filter of acti-



vated carbon to provide means for maintaining a liquid level through which said gases must pass, said open end tube having a porous medium of wettable material in its lower end portion for positioning in communication with and at least partially below the surface of acid electrolyte within said battery.

4,394,424

PRINTING SCREEN AND METHOD OF MAKING SAME

Frank A. Sportelli, 7 Redwood Ct., Glen Cove, N.Y. 11542

Filed Aug. 11, 1981, Ser. No. 292,087

Int. Cl.³ G03F 5/00; G03C 5/00

U.S. Cl. 430—6 **20 Claims**

1. A method of making a photoprinting image element, said method comprising:

(a) providing a negative screen having two sets of parallel equispaced lines located thereon, each said set being perpendicular to each other,

(b) providing a photographic film to be exposed,

(c) exposing the negative screen onto the photographic film in two separate exposures,

(d) said negative screen being disposed at a predetermined angle in each said separate exposure,

(e) each said predetermined angle being at a different angle with respect to each other, and

(f) developing the exposed photographic film to produce a photoprinting image element having a regular screen pattern as shown in FIG. 2.

3. The method as defined in claim 1 wherein:

the negative screen is a gravure negative screen, and

there is a separate exposure at each of the predetermined photoprinting angles of 105° and 75°.

4,394,425

PHOTOCONDUCTIVE MEMBER WITH α-SI(C) BARRIER LAYER

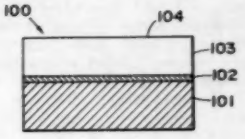
Isamu Shimizu, Yokohama; Shigeru Shirai, Yamato, and Eiichi Inoue, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1981, Ser. No. 299,576

Claims priority, application Japan, Sep. 12, 1980, 55-127542; Sep. 12, 1980, 55-127543; Sep. 13, 1980, 55-127490; Sep. 24, 1980, 55-133209; Sep. 24, 1980, 55-133210; Sep. 24, 1980, 55-133211

Int. Cl.³ G03G 5/082, 5/14

U.S. Cl. 430—65 **98 Claims**



1. A photoconductive member comprising: a support, a photoconductive layer consitituted of an amorphous material containing silicon atoms as a matrix and containing hydrogen atoms or halogen atoms, and an intermediate layer provided between them, said intermediate layer having a function to bar penetration of carriers from the side of the support into the photoconductive layer and to permit passage from the photoconductive layer to the support of photocarriers generated in the photoconductive layer by projection of electromagnetic waves and movement of the photocarriers toward the side of the support, and said intermediate layer being constituted of an amorphous material containing silicon atoms and carbon atoms as constituents and wherein said intermediate layer is non-photoconductive in the visible light region and is from 30 to 1,000 Angstroms in thickness.

4,394,426

PHOTOCONDUCTIVE MEMBER WITH α-SI(N) BARRIER LAYER

Isamu Shimizu, Yokohama; Shigeru Shirai, Yamato, and Eiichi Inoue, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

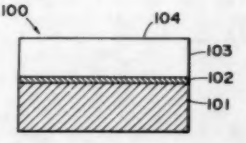
Filed Sep. 22, 1981, Ser. No. 304,568

Claims priority, application Japan, Sep. 25, 1980, 55-134114; Sep. 25, 1980, 55-134115; Sep. 25, 1980, 55-134116; Sep. 30, 1980, 55-137149; Sep. 30, 1980, 55-137150; Sep. 30, 1980, 55-137151

The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.

Int. Cl.³ G03G 5/082, 5/14

U.S. Cl. 430—65 **98 Claims**



1. A photoconductive member comprising: a support, a photoconductive layer constituted of an amorphous material containing silicon atoms as matrix and containing hydrogen atoms or halogen atoms, and an intermediate layer provided between them, said intermediate layer having a function to bar penetration of carriers from the side of the support into the photoconductive layer and to permit passage from the photo-

conductive layer to the support of photocarriers generated in the photoconductive layer by projection of electromagnetic waves and movement of the photocarriers toward the side of the support, and said intermediate layer being constituted of an amorphous material containing silicon atoms and nitrogen atoms as constituents and wherein said intermediate layer is non-photoconductive in the visible light region and is from 30 to 1,000 Angstroms in thickness.

4,394,427

ELECTROPHOTOGRAPHIC SENSITIZING SCREEN WITH PERIPHERALLY CLOGGED APERTURES

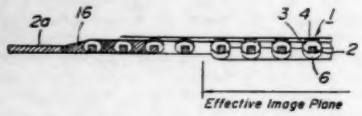
Masaji Nishikawa; Norio Amemiya; Tadahiro Yasuda, and Shigeru Nakayama, all of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Continuation of Ser. No. 981,315, Nov. 28, 1979, abandoned. This application Mar. 26, 1981, Ser. No. 247,783

Claims priority, application Japan, Jun. 24, 1977, 52-74969; Jun. 24, 1977, 52-74970; Jun. 24, 1977, 52-74971; Jun. 24, 1977, 52-74972; Jun. 24, 1977, 52-74973

Int. Cl.³ G03G 5/04

U.S. Cl. 430—68 **6 Claims**



1. An electrophotographic sensitizing screen formed from a conductive mesh having a plurality of apertures therein extending over the surface and to the peripheral edges thereof in a regular array, said mesh including an insulating layer applied thereto, a conductive layer overlying said insulating layer, and a photosensitive layer overlying said conductive layer the improvement comprising clogged apertures extending inwardly of the peripheral edges of said screen to define a peripheral area, said apertures in said peripheral area clogged with an insulative synthetic resin to block the passage of corona ions therethrough, said area of said screen interiorly of said peripheral area serving as an image area, said conductive layer extending over said image area at least to said peripheral area.

4,394,428

PHOTOCONDUCTIVE COMPOSITION AND ELEMENTS COMPRISING TWO DIFFERENT COMPOUNDS HAVING A DIOXABORIN NUCLEAS ON A DERIVATIVE THEREOF

James A. Van Allan; Jerome H. Perlstein; George A. Reynolds, and Thomas E. Goliber, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 24, 1981, Ser. No. 305,257

Int. Cl.³ G03G 5/09

U.S. Cl. 430—83 **5 Claims**

1. A photoconductive element comprising a support and a layer of a photoconductor composition comprising:

(a) an electron donating photoconductor; and sensitizing amounts of

(b) a first electron acceptor selected from cyanine and styryl methine dyes having a 1,3,2-dioxaborin nucleus and

(c) a second electron acceptor selected from methine-free compounds having a nucleus selected from the group consisting of 1,3,2-dioxaborin; 1,3,2-oxazoborin and 1,3,2-diazoborins.

4,394,429

DEVELOPMENT PROCESS AND APPARATUS

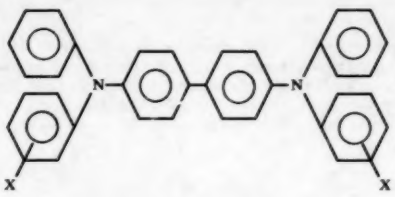
Dan A. Hays, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 155,889, Jun. 2, 1980, abandoned. This application Sep. 21, 1981, Ser. No. 304,437

Int. Cl.³ G03G 13/08, 13/09

U.S. Cl. 430—102 **13 Claims**

1. An improved process for causing the development of electrostatic latent images on an imaging member, comprising providing a development zone ranging in length of from about 0.5 centimeters to about 5 centimeters, which development zone is encompassed by a tensioned deflected flexible imaging member and a transporting member wherein the flexible imaging member is comprised of a supporting substrate, a photogenerating layer, and a transport layer comprised of electrically active diamine molecules dispersed in an inactive resinous binder, the diamine molecules being of the formula



wherein X is selected from the group consisting of (ortho) CH_3, (meta) CH_3, (para) CH_3, (ortho) Cl, (meta) Cl, (para) Cl, causing the deflected flexible imaging member to move at a speed of from about 5 cm/sec to about 50 cm/sec, causing the transporting member to move at a speed of from about 6 cm/sec to about 100 cm/sec, said deflected flexible imaging member and said transporting member moving at different speeds, the ratio of the velocity of the transporting member to the flexible imaging member being greater than zero and less than 1 with the development time ranging from 0.83 seconds to about $5 \cdot 10^3$ seconds, maintaining a distance between the flexible imaging member and the transporting member of from about 0.05 millimeters to about 1.5 millimeters, adding insulating developer particles to the development zone, which particles are comprised of electrically insulating toner particles, and electrically insulating magnetic carrier particles, the flexible imaging member being deflected by the electrically insulating developer particles, wherein the deflection of the flexible imaging member caused by the insulating developer particles contained in the development zone is in the form of an arc of from about 10° to about 50°, contained in the development zone, introducing a high electric field in the development zone, wherein the developer particles contained in the development zone are agitated, and the insulating toner particles migrate from one layer of carrier particles to another layer of carrier particles in the development zone, the carrier particles rotating in one direction and subsequently in another direction, whereby toner particles are continuously made available immediately adjacent the deflected flexible imaging member, said process being accomplished in the absence of a magnetic field.

4,394,430

ELECTROPHOTOGRAPHIC DRY TONER AND DEVELOPER COMPOSITIONS

Thomas A. Jadwin, Rochester, and Robert C. Storey, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

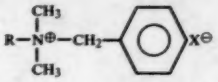
Filed Apr. 14, 1981, Ser. No. 254,028

Int. Cl.³ G03G 9/10

U.S. Cl. 430—110 **7 Claims**

1. A two-component electrophotographic developer comprising magnetic carrier particles and a dry particulate electro-

photographic toner comprising a major amount of binder polymer and dispersed therein as a charge control agent in an amount of 0.01 to 3 weight percent of the particulate toner, a quaternary ammonium salt of the formula:



wherein R is alkyl of 12 to 24 carbon atoms and $X^{\ominus}$ is an anion.

4,394,431

METHOD FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE WITH A LIQUID DEVELOPER

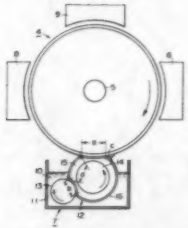
Takashi Saito, Ichikawa; Junichi Sakurayama, and Tsuyoshi Watanabe, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 97,861, Nov. 27, 1979, abandoned. This application Oct. 1, 1981, Ser. No. 307,523

Claims priority, application Japan, Dec. 12, 1978, 53-153966

Int. Cl.³ G03G *15/10*

U.S. Cl. 430—119 **6 Claims**



1. A method for developing an electrostatic latent image comprising the steps of bringing a rigid member into pressure contact with a rotary member having a porous elastic member in the form of a layer provided about the periphery thereof to cause said elastic member to be refreshed therein with liquid developer in accordance with the elastic deformation of the elastic member, urging said rotary member against an electrostatic latent image bearing surface and rotating said rotary member to supply the liquid developer to said bearing surface, thereby carrying out development of the electrostatic latent image, and regulating the amount of elastic deformation of said elastic member in the direction of its thickness produced by the pressure contact thereof with said rigid member to be equivalent to or larger than the elastic deformation of said elastic member in the direction of its thickness produced by the pressure contact thereof with said bearing surface.

4,394,432

METHOD FOR PRINTING A PLURALITY OF DUPLICATED COPIES FROM THE SAME ELECTROSTATIC CHARGE LATENT IMAGE

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

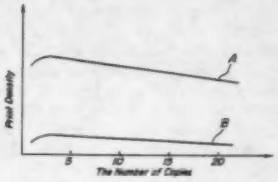
Continuation of Ser. No. 9,585, Feb. 5, 1979, abandoned. This application May 29, 1981, Ser. No. 268,329

Claims priority, application Japan, Feb. 8, 1978, 53-13995

Int. Cl.³ G03G *13/16*

U.S. Cl. 430—120 **5 Claims**

1. An improved method of printing a plurality of duplicated copies with the aid of a single electrostatic charge latent image formed on an electrostatic charge retentive member to form an electrostatic charge latent image corresponding to an image of a document to be duplicated on a charge retentive member and developing the latent image with a developer to form a visible toned image on the charge retentive member; transferring the toned image onto an image receiving member; fixing the transferred toned image on the image receiving member; and successively repeating the developing, transferring and fixing steps for the same and single latent image so as to form a plurality of duplicated copies, the improvement comprising the step of: gradually increasing the total amount of the developer



supplied to the latent image on the charge retentive member while maintaining the toner concentration substantially constant for developing the latent image in such a manner, that both a large variation in print density at a higher density part in the image and a small variation in print density at a lower density part for successive copies are simultaneously corrected.

4,394,433

DIAZONIUM IMAGING SYSTEM

Kenneth G. Gatzke, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 101,143, Dec. 7, 1979, abandoned. This application Jul. 23, 1981, Ser. No. 286,197

Int. Cl.³ G03C *1/60, 5/18, 1/727*

U.S. Cl. 430—151 **18 Claims**

1. An article comprising a light sensitive, positive-acting, heat developable, dry layer on a substrate, the dry ingredients of said layer comprising at least 25% by weight of a polymeric binder, at least 0.3% by weight of a leuco dye capable of being oxidized to a colored form upon only heating, a sufficient amount of a photosensitive diazonium salt to oxidize said leuco dye to a colored form in non-light struck portions of said layer, and less than 0.1 mole nitrate ion per 1.0 mole leuco dye, said leuco dye in said layer being present in a concentration sufficient to provide an increase in optical density upon development of at least 0.2.

18. A process for imaging an article comprising a light sensitive, positive-acting, heat developable, dry layer on a substrate, the dry ingredients of said layer comprising at least 25% by weight of a polymeric binder, at least 0.3% by weight of a leuco dye capable of being oxidized to a colored form upon only heating, a sufficient amount of a photosensitive diazonium salt to oxidize said leuco dye to a colored form in non-light struck portions of said layer, and less than 0.1 mole nitrate ion per 1.0 mole leuco dye, said leuco dye in said layer being present in a concentration sufficient to provide an increase in optical density upon development of at least 0.2, said process comprising the steps:

a. exposing said article to an image-wise distribution of radiation to destroy said diazonium salt in light-struck areas, and

b. heating said article to enable said diazonium salt to oxidize said leuco dye to a colored form in non light-struck areas to produce said positive image.

4,394,434

PLATING RESIST WITH IMPROVED RESISTANCE TO EXTRANEOUS PLATING

Robert R. Rohloff, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

PCT No. PCT/US80/00876, § 371 Date Dec. 8, 1980, § 102(e) Date Dec. 8, 1980, PCT Pub. No. WO81/00310, PCT Pub. Date Feb. 5, 1981

PCT Filed Jul. 15, 1980, Ser. No. 282,180

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—270 **23 Claims**

1. A photohardenable resist composition comprising polymerizable organic binder, a photoinitiator capable of initiating polymerization of said binder upon exposure to actinic radiation, and an effective amount, greater than 1% by weight, of aluminum oxide microparticles dispersed throughout said binder, said aluminum oxide microparticles being made by the flame hydrolysis of anhydrous aluminum halide.

4,394,435

SYNDIOTACTIC POLYBUTADIENE COMPOSITION FOR A PHOTOSENSITIVE PRINTING PLATE

Milton Farber, Bethany, Conn., and John R. Worns, Mishawaka, Ind., assignors to Uniroyal, Inc., New York, N.Y.

Filed Oct. 1, 1981, Ser. No. 307,360

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—287 **26 Claims**

1. An elastomeric composition for making a printing plate comprising (A) a mixture of syndiotactic 1,2-polybutadiene (SBD) and cis-1,4-polyisoprene (cis-IR); (B) between about 0.1 and 5 phr of a photoinitiator activatable by actinic radiation; and (C) from 0 to 3 phr of a photopolymerizable ethylenically unsaturated compound, wherein (A) comprises 30 to 75% cis-IR and correspondingly 70 to 25% SBD by weight.

4,394,436

Patent Not Issued For This Number

4,394,437

PROCESS FOR INCREASING RESOLUTION OF PHOTOLITHOGRAPHIC IMAGES

Albert S. Bergendahl, Underhill; Mark C. Hakey, Milton, and John P. Wilson, Hinesburg, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 24, 1981, Ser. No. 305,056

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—312 **9 Claims**

1. A method of developing relief images in a first layer of photoresist comprising the steps of:

applying a first layer of photoresist, sensitive to a selected wavelength of light, a selected solvent and a selected developer, to the surface of a substrate;

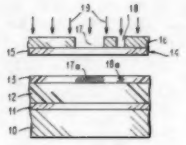
applying a second layer of photoresist over said first layer; said second layer of photoresist being sensitive to a wavelength of light, a solvent and a developer different from said selected wavelength, solvent and developer to which said first layer of photoresist is sensitive,

forming a first relief image in said second layer of photoresist by exposure through a fixed mask having an image thereon,

partially exposing said first layer of photoresist using said second layer as a mask,

removing said second layer of photoresist,

applying a third layer of photoresist over said first layer, said third layer of photoresist being sensitive to a wavelength of light, a solvent and a developer different from said



selected wavelength, solvent and developer to which said first layer of photoresist is sensitive,

forming a second relief image in said third layer substantially identical to the first relief image formed in said second layer by exposure through a second mask having the same image as the said first mask but having different defects thereon,

re-exposing said first layer of photoresist using said third layer as a mask to fully expose only those partially exposed portions of said first layer thereof corresponding to areas being exposed by said third layer; and

developing a relief image in said first layer of photoresist, said relief image having openings extending to the surface of said substrate only in said fully exposed areas.

4,394,438

METHOD OF MANUFACTURING AN OPTICALLY READABLE INFORMATION CARRIER USING DEEP U.V. RADIATION

Pieter Van Pelt, Sunnyvale, Calif., and Gerardus J. M. Lippits, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,703

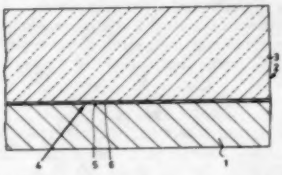
Claims priority, application Netherlands, Dec. 22, 1980, 8006947

Int. Cl.³ G03C *5/04*; G01D *15/02, 15/24*

U.S. Cl. 430—321 **3 Claims**

1. A method of manufacturing an optically readable information carrier in which a substrate plate is provided on one side or on both sides with an optical structure which structure comprises an information track of information areas situated alternatively at a higher and a lower level, characterized in that a substrate plate which is manufactured entirely from

polymethylmethacrylate is exposed, according to a lithographic process, to deep ultraviolet light through a mask which is brought into contact with a surface of said substrate plate, said mask comprising a supporting plate which is transparent to deep ultraviolet light, said supporting plate being provided on the side facing the substrate with a layer of material impermeable to deep ultraviolet light, in which layer a



pattern is provided corresponding to the optical structure to be provided in the substrate plate and the substrate plate thus exposed through said mask is then treated with a developer capable of disolving the exposed parts of said polymethylmethacrylate thereby dissolving the exposed parts of said polymethylmethylacrylate and forming an information track on said substrate plate.

4,394,439

NON-SILVER X-RAY RECORDING PROCESS

Jean J. Robillard, 46 Arnold Rd., Pelham, Mass. 01002

Filed May 28, 1981, Ser. No. 267,685

Int. Cl.³ G03C 5/24

U.S. Cl. 430—336 **10 Claims**

1. A process for forming a permanent record of an X ray image onto a transparent substrate which comprises

(A) providing a photosensitive film comprising

(1) a film substrate made of a photodegradable halogenated polymer, and

(2) an image forming layer on said film substrate, said image forming layer comprising

(a) an halogenated free radical sensitive dye former, and

(b) a complexing agent, which is an organic metal salt said (a) and (b) being uniformly dispersed in an organic binder;

(B) photographically, imagewise exposing the photosensitive film to an X ray image to imagewise photodegrade the polymer and selectively generate halogenated free radicals; and

(C) heating the exposed photosensitive film to allow the imagewise generated halogenated free radicals to react with the dye former to thereby form a dye image and complex the dye with the complexing agent to finally provide a dye complex image.

4,394,440

YELLOW-DYE-FORMING PHOTOGRAPHIC DEVELOPING COMPOSITION

Carl R. Cappel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

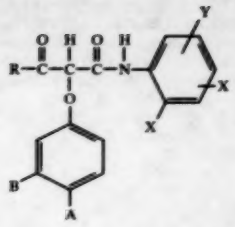
Filed Jan. 22, 1982, Ser. No. 341,712

Int. Cl.³ G03C 7/16, 7/00

U.S. Cl. 430—379 **7 Claims**

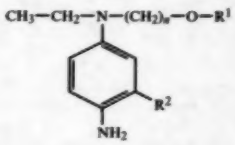
6. In a method of reversal color processing of a photographic element in which said element is developed in a yellow-dye-forming photographic developing solution, the improvement wherein said solution comprises

(1) a haloacetanilide coupler of the formula

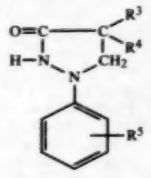


wherein R is a branched alkyl group of 3 to 6 carbon atoms, X is Cl or Br, Y is X, hydrogen or alkyl of 1 to 8 carbon atoms, and A and B differ and are either H or COOM where M is a photographically inactive cation or a methyl or ethyl group;

(2) an N-alkyl-N-alkoxyalkyl-p-phenylenediamine developing agent of the formula



wherein n is an integer having a value of from 2 to 4, R^1 is alkyl of from 1 to 4 carbon atoms, and R^2 is alkyl of from 1 to 4 carbon atoms or alkoxy of from 1 to 4 carbon atoms; and (3) a 4,4-disubstituted-1-aryl-3-pyrazolidinone balancing developing agent of the formula



wherein R^3 and R^4 are the same or different and each is alkyl of 1 to 6 carbon atoms or hydroxyalkyl of 1 to 6 carbon atoms, and R^5 is hydrogen, halogen, alkyl of 1 to 6 carbon atoms, or alkoxy of 1 to 6 carbon atoms.

4,394,441

PHOTOGRAPHIC SENSITIVE MATERIALS

Hideo Kawaguchi, Minami-ashigara; Takayuki Inayama, Fujinomiya; Masaaki Takimoto, Tokyo, and Yoshihiro Ono, Asaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 15, 1982, Ser. No. 339,798

Claims priority, application Japan, Jan. 14, 1981, 56-4442

Int. Cl.³ G03C 1/84

U.S. Cl. 430—524 **12 Claims**

1. A photographic sensitive material comprising at least one silver halide sensitive layer provided on a plastic film base through a subbing layer, wherein the improvement comprises said subbing layer containing fine particles of at least one electrically conductive crystalline metal oxide selected from ZnO, TiO_2, SnO_2, Al_2O_3, In_2O_3, SiO_2, MgO, BaO, and MoO_3, or a compound oxide thereof having a volume resistivity of 10^7 Ω cm or less, dispersed in an organic polymer binder.

4,394,442
POST-STRETCH WATER-DISPERSIBLE SUBBING COMPOSITION FOR POLYESTER FILM BASE

Conrad E. Miller, Hendersonville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 15, 1982, Ser. No. 357,908
Int. Cl.³ G03C *1/78*
U.S. Cl. 430—532 **6 Claims**

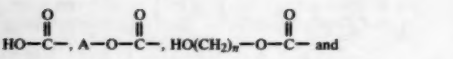
1. An article of manufacture comprising an energy-treated biaxially oriented polyester film base coated with

(1) a subbing layer applied from an aqueous dispersion of a linear copolyester having a relative viscosity of from about 1.3 to about 1.7 measured as a 0.58% solution in m-cresol at 25° C. which comprises the reaction product of substantially equimolar equivalents of at least two dicarboxylic acids and at least one dihydric alcohol, said dicarboxylic acid equivalents being supplied by a plurality of acid reactants which, based on a total of 100% (molar) acid equivalents, includes from about 0.1% (molar) to about 10% (molar) equivalents of an aromatic sulfonated compound having a structural formula,

wherein:

M is a monovalent cation selected from the group of an alkali metal, ammonium substituted ammonium, and quaternary ammonium;

X and Y are monovalent radicals individually selected from the group having structural formulas consisting of



wherein

A is a lower alkyl group having 1–5 carbon atoms; m and n are positive integers of less than 20 with n being greater than 1; and Z is a trivalent aromatic radical;

and wherein said copolyester is not branched, crosslinked, or used with a crosslinking agent; and

(2) a gelatin-containing layer contiguous thereto.

4,394,443
METHOD FOR CLONING GENES

Sherman M. Weissman, New Haven, Conn.; Dennis Pereira, Westerly, R.I., and Ashwani Sood, New Haven, Conn., assignors to Yale University, New Haven, Conn.

Filed Dec. 18, 1980, Ser. No. 217,643
Int. Cl.³ C12Q *1/68*; C12P *21/00, 21/02*; C12N *15/00*; C12P *19/34*; G01N *33/50*
U.S. Cl. 435—6 **12 Claims**

1. A method for isolating and indentifying a recombinant clone having a DNA segment therein coding for at least one desired heterologous polypeptide, at least a short amino acid sequence of which is known, said method comprising the steps of:

(a) effecting cDNA synthesis on a mixture of mRNAs containing a target mRNA coding for said at least one polypeptide, and isolating the resultant cDNA mixture;

(b) inserting said resultant cDNA into recombinant cloning vehicles, and transforming hosts with said vehicles; and

(c) separating the transformants and isolating and identifying a recombinant clone containing a DNA segment which is homologous over at least a portion thereof to at least one oligonucleotide probe specific for said DNA segment, said identification being effected by hydridization with said probe; wherein said probe is an extension of the nucleotide sequence of an oligonucleotide primer having a nucleotide sequence complementary to a region of said target mRNA coding for a portion of said known amino acid sequence, said oligonucleotide probe being produced by separately effecting cDNA synthesis in the presence of said oligonucleotide primer and only three deoxynucleotide triphosphates, isolating and separating extended cDNA fractions having at least three more nucleotides than said primer, sequencing said extended fractions, and recovering at least one oligonucleotide complementary to a longer region of said target mRNA coding for a longer portion of said known amino acid sequence.

4,394,444
COFACTOR INDICATOR COMPOSITIONS

Erma C. Cameron, Mishawaka; Claude R. Gunter, Elkhart, and Rodric H. White-Stevens, Howe, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jun. 21, 1982, Ser. No. 390,252
Int. Cl.³ C12Q *1/60*
U.S. Cl. 435—11 **36 Claims**

1. A composition for the determination of an analyte in a sample which composition comprises:

an analyte-responsive component comprising a pyridine nucleotide susceptible of reduction in response to the presence of said analyte and at least one constituent interreactive with said analyte to cause reduction of the pyridine nucleotide;

a hydroxylase capable of being uncoupled and a pseudosubstrate capable of uncoupling said hydroxylase, which hydroxylase and pseudosubstrate, in the presence of the reduced form of said pyridine nucleotide, are effective to generate hydrogen peroxide;

a peroxidatively active substance; and

a hydrazone indicator comprising a hydrazone and a coupler, which indicator, when in its oxidized form, cannot be reduced by said pyridine nucleotide.

4,394,445
ENZYMATIC GLYCERIDE HYDROLYSIS

Paul T. Nix, 62 Forest Dr., Jackson, N.J. 08527; Janet M. Santoro, 70 Kingsly Way, Freehold, N.J. 07728, and Joyce E. Stephens, P.O. Box 51, Avon-by-Sea, N.J. 07717

Continuation of Ser. No. 187,664, Sep. 16, 1980, abandoned, and a continuation of Ser. No. 13,862, Feb. 22, 1979, abandoned. This application Dec. 15, 1981, Ser. No. 331,449
Int. Cl.³ C12Q *1/44*
U.S. Cl. 435—19 **9 Claims**

1. A composition useful for the hydrolysis of a glycerol ester in an aqueous medium comprising a mixture of from about 65 to 91 units of *Rhizopus arrhizus* lipase and from about 35 to 9 units of *Pseudomonas fluorescens* lipase per 100 units of total lipase.

4,394,446
PROCESS FOR THE PREPARATION OF THE ANTIBIOTIC OXANOSINE

Hamao Umezawa; Nobuyoshi Shimada, both of Tokyo; Hiroshi Naganawa, Honmachi; Tomohisa Takita, Asaka; Masa Hamada, Naito, and Tomio Takeuchi, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Nov. 20, 1981, Ser. No. 323,650
Claims priority, application Japan, Nov. 22, 1980, 55-165159
Int. Cl.³ C12P *19/40*; C12N *1/20*; C12R *1/465*
U.S. Cl. 435—88 **3 Claims**

1. A process for the preparation of the antibiotic oxanosine which comprises cultivating *Streptomyces capreolus* MG265-CF3, ATCC No. 31963 until a substantial amount of oxanosine

is accumulated in the culture medium, and recovering the oxanosine from the culture medium.

4,394,447

PRODUCTION OF HIGH-PYRUVATE XANTHAN GUM ON SYNTHETIC MEDIUM

Martin C. Cadmus, and Clarence A. Knutson, Jr., both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 23, 1978, Ser. No. 908,601
Int. Cl.³ C12P 19/06, 19/04; C12R 1/64
U.S. Cl. 435—104 3 Claims

1. In a process for producing polysaccharides by fermentation of a carbohydrate-containing nutrient medium with the bacterium *Xanthomonas campestris*, wherein said bacterium is cultivated on said medium under conditions suitable for its growth, the improvement comprising:

a. providing $(NH_4)_2HPO_4$ as the primary nitrogen source in said nutritent medium at a level of at least 0.15 g./100 ml. of medium;

b. providing a total phosphate level in said nutrient medium of at least 0.25 g./100 ml. of medium; and

c. recovering from said fermentation medium a polysaccharide isolated from residual solids in said medium wherein said polysaccharide has a pyruvic acid content of at least 3.3% by weight.

4,394,448

METHOD OF INSERTING DNA INTO LIVING CELLS

Francis C. Szoka, Jr., 76 Summit St., Waltham, Mass. 02154, and Demetrios P. Papahadjopoulos, 3170 Condit St., Lafayette, Calif. 94549

Continuation-in-part of Ser. No. 881,116, Feb. 24, 1978, Pat. No. 4,235,871. This application Apr. 24, 1980, Ser. No. 143,455
Int. Cl.³ C12N 15/00
U.S. Cl. 435—172 11 Claims

1. A method of inserting deoxyribonucleic acid into a living cell, which comprises; encapsulating the acid material in a lipid vesicle and bringing the vesicle in contact with said cell, whereby insertion occurs.

4,394,449

STABILIZATION OF COENZYMES IN AQUEOUS SOLUTION

Ivan E. Modrovich, 1043 Mesa Dr., Camarillo, Calif. 93010

Filed Feb. 13, 1980, Ser. No. 121,225
The portion of the term of this patent subsequent to Jul. 7, 1998, has been disclaimed.
Int. Cl.³ C12N 9/96; C12Q 1/58, 1/50, 1/34
U.S. Cl. 435—188 27 Claims

1. A stabilized aqueous coenzyme solution for use in the clinical assay of a selected biological constituent through the enzymic reaction of an enzyme or enzymes with selective substrates for the enzymes and a labile coenzyme, said aqueous coenzyme solution comprising:

(a) at least one first enzyme and a first substrate for selectively reacting with the first enzyme in the assay of the selected biological constituent;

(b) a labile coenzyme for interacting with the first enzyme and first substrate, which labile coenzyme degrades in said aqueous solution to a coenzyme conversion product; and

(c) an enzyme and substrate system comprising at least one second enzyme and a selective second substrate for the second enzyme, which second enzyme and second substrate react in said aqueous enzyme solution with the coenzyme conversion product to form the coenzyme.

4,394,450

METHOD FOR PURIFICATION OF URICASE

David A. Brock, and Surendra K. Gupta, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 1, 1982, Ser. No. 353,484
Int. Cl.³ C12N 9/06; C12Q 1/62
U.S. Cl. 435—191 7 Claims

1. A method for purifying uricase by decreasing the amount of active catalase present which comprises adjusting the pH of a catalase-containing uricase preparation to a pH in the range of about 11 to 13 to inactivate said catalase, and recovering therefrom a uricase preparation substantially free of active catalase.

4,394,451

CULTURE MEDIUM AND CONDITIONS FOR GROWTH OF MAGNETIC BACTERIA

Richard P. Blakemore, Durham, N.H., and Ralph S. Wolfe, Champaign, Ill., assignors to BioMagnetech Corp., New York, N.Y.

Filed Oct. 30, 1980, Ser. No. 202,160
Int. Cl.³ C12N 1/20; C12R 1/01; C12P 3/00
U.S. Cl. 435—253 27 Claims

1. An aqueous culture medium for the growth of a biologically pure culture of magnetic bacteria, comprising, per 100 ml, about 2–30 μM of ferric quinate, about 10–1000 mg of an organic compound selected from the group consisting of fumaric acid, tartaric acid, malic acid, succinic acid, lactic acid, pyruvic acid, oxaloacetic acid, malonic acid, β-hydroxybutyric acid, maleic acid, galactose, rhamnose, melibiose, acetic acid, adipic acid, and glutaric acid, a vitamin source, a mineral source, a nitrogen source, an acetate source, and a pH buffer, said pH buffer resulting in a pH of said aqueous culture medium of about 5.2–7.5.

4,394,452

SYNTHETIC STOOL

Roland Hartl, Eppertshausen, and Dieter Helm, Heppenheim, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 910,285
Claims priority, application Fed. Rep. of Germany, May 31, 1977, 2724438; May 2, 1978, 2819284
Int. Cl.³ G01N 33/72; C09K 3/00
U.S. Cl. 436—66 2 Claims

1. A synthetic human stool, spreadable on a substrate and adaptable to use as a control standard in the diagnostic detection of occult blood in the stool, said synthetic stool consisting essentially of a matrix of a member selected from the group consisting of oxygen-containing organic polymers which are difficultly soluble in water and oxygen-containing inorganic solids difficultly soluble in water, a non-bleeding coloring agent adherent to said matrix and simulating the color of a human stool, a liquid selected from the group consisting of water and lubricants, and a predetermined amount of hemolyzed human blood, said coloring agent on treatment with hydrogen peroxide showing no change in color or no change in color interfering with such a diagnostic detection of occult blood.

4,394,453

ENVELOPES FOR TUNGSTEN-HALOGEN LAMPS

William H. Dumbaugh, Jr., Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sep. 8, 1981, Ser. No. 299,737
Int. Cl.³ C03C 3/08
U.S. Cl. 501—66 2 Claims

1. A glass envelope for a tungsten-halogen incandescent lamp, said glass exhibiting a strain point of at least 670° C., a coefficient of thermal expansion (0°–300° C.) of $42–45\times10^{-7}$/°C., a liquidus temperature below 1150° C., and a viscosity at the liquidus temperature greater than 2×10^4

poises, and consisting essentially, expressed in weight percent on the oxide basis, of

SiO_2	60.0 ± 1.5
Al_2O_3	17.0 ± 1.0
B_2O_3	5.0 ± 0.8
CaO	11.4 ± 0.8
MgO	7.5 ± 0.8

the total $Al_2O_3 + SiO_2$ being held between 74.5–78, the weight ratio SiO_2:Al_2O_3 being held between about 3.3–3.8, and the weight ratio CaO:MgO being held between about 1.3–1.8.

4,394,454

METHOD FOR MAKING SINTERED DOLOMITE WITH A LOW POROSITY AND A GOOD HYDRATION STABILITY

Karlheinz Rösener, Dusseldorf; Alfred Roeder, Duisburg; Wolfgang Münchberg, Hagen; Herbert Richrath, Hagen, and Max Chmiel, Hagen, all of Fed. Rep. of Germany, assignors to Dolomitwerke GmbH, Wulfrath, Fed. Rep. of Germany

Filed Jan. 25, 1982, Ser. No. 342,449

Claims priority, application Fed. Rep. of Germany, May 9, 1981, 3118481

Int. Cl.³ C04B *35/04*

U.S. Cl. 501—112 11 Claims

1. In a method for making a dolomite sinter with a low porosity and a good hydration stability made of milled raw dolomite comprising the steps of adding foreign oxides to milled pure raw dolomite powder having a low content of foreign oxides, pressing the milled raw dolomite powder-foreign oxide admixture into briquets, and heating the briquets to a sintering temperature, the improvement comprising:

adding a member selected from the group consisting of burnt dolomite, dolomite hydrate, semi-burnt dolomite and combinations thereof in quantities of between 3 and 20% by weight, relative to the total mixture, to said raw dolomite powder and wherein said foreign oxides are added in such quantities such that the total content of foreign oxides is 1 to 3% by weight calculated on the ignition loss free mixture.

4,394,455

SPINEL SLIP CASTING COMPOSITION AND ARTICLES

Dale M. Bertelsman, Lake Jackson; William M. Eckert, Angleton, and Stanley J. Morrow, Clute, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 217,712, Dec. 18, 1980, abandoned. This application Aug. 31, 1981, Ser. No. 298,048

Int. Cl.³ C04B *35/04*

U.S. Cl. 501—117 13 Claims

1. A casting composition comprising

(A) 10 to about 60 percent by weight of a powder of a spinel prepared by coprecipitation of metal hydroxides or metal compound convertable to the metal hydroxides, dried and calcined to between about 400° and 1400° C.; and

(B) the balance water and a sufficient deflocculating agent to form a substantially stable dispersion of the powder.

4,394,456

TEMPERATURE-COMPENSATING CERAMIC DIELECTRICS

Yukio Sakabe, Kyoto, and Goro Nishioka, Hirakata, both of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Apr. 7, 1982, Ser. No. 366,328

Claims priority, application Japan, Apr. 13, 1981, 56-56175

Int. Cl.³ C04B *35/46*; H01B *3/12*

U.S. Cl. 501—138 2 Claims

1. A temperature-compensating ceramic dielectric consisting essentially of a composition consisting essentially of 35 to 65 wt.% of neodymium titanate ($Nd_2Ti_2O_7$), 10 to 35 wt.% of barium titanate ($BaTiO_3$), 10 to 35 wt.% of titanium oxide (TiO_2), 1 to 6 wt.% of bismuth oxide (Bi_2O_3) and 1 to 10 wt.% of lead oxide (Pb_3O_4), and including 1 to 6 wt.% of zinc oxide (ZnO) and 1 to 6 wt.% of silicon oxide (SiO_2).

4,394,457

POROUS COMPOSITE MATERIAL AND PROCESS FOR PREPARING SAME

Tatsuo Ogasa, Yokohama, Japan, assignor to Agency of Industrial Science & Technology, Japan

Division of Ser. No. 72,185, Sep. 4, 1979, Pat. No. 4,252,907. This application Apr. 28, 1980, Ser. No. 144,205

Claims priority, application Japan, Nov. 18, 1978, 53-142522

Int. Cl.³ C08J *9/40*, *9/42*

U.S. Cl. 521—54 4 Claims

1. A porous foamed material comprising a porous, foamed body formed of hydrophobic polymer having a multiplicity of pores dispersed in said body and each communicating with the surface of the body and providing a porosity of 10–70% for said body, said hydrophobic polymer being selected from the group consisting of polyolefin resins, styrene resins, acrylic resins and polyvinyl chloride resins, and having a layer provided over at least a portion of the interior surface of each of said pores and containing a hydrophilic polymer selected from the group consisting of polyvinyl alcohol, polyacrylic acid, polyvinyl pyrrolidone, polyethylene glycol and a salt of polyacrylic acid, in a weight ratio of 1–25 parts of said hydrophilic polymer per 100 parts of said hydrophobic polymer, said porous foamed material being the product of emulsification of an aqueous solution containing said hydrophilic polymer and a foaming agent into a solution of said hydrophobic polymer in an organic solvent, wherein liquid particles of said aqueous solution are dispersed in said organic solvent to form an emulsion, followed by removal of non-solids from the emulsion and by foaming of the remaining solid obtained from said emulsion to obtain said porous, foamed body.

4,394,458

ALKALI METAL BOROHYDRIDE CONCENTRATE

Robert C. Wade, Ipswich, Mass., assignor to Thiokol Corporation, Chicago, Ill.

Division of Ser. No. 272,867, Jun. 12, 1981, abandoned. This application Jul. 14, 1982, Ser. No. 398,057

Int. Cl.³ C08J *9/06*

U.S. Cl. 521—82 5 Claims

1. A method of making a solid, substantially inert, and stable alkali metal borohydride blowing agent concentrate, comprising:

a. dry blending from 0.5% to 20% by weight of dried alkali metal borohydride with a dried inert resinous polymer in which reactive protonic hydrogen atoms are substantially absent to form a mixture thereof containing less than about 0.1% by weight adsorbed water;

b. heating said mixture to a temperature above the melting point of said resin to form a molten mixture;

c. extruding said molten mixture to form a solid, stable and substantially inert concentrate; and

d. forming said extruded and cooled concentrate into pellets.

4,394,459

FAST-CURING FOAMABLE COMPOSITION BASED ON ETHYLENE TERPOLYMERS

John Rys-Sikora, Bel Aire, Md., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 303,479, Sep. 18, 1981, Pat. No. 4,370,423. This application Sep. 2, 1982, Ser. No. 414,452

Int. Cl.³ C08J *9/06*

U.S. Cl. 521—84 4 Claims

1. A crosslinked closed-cell microcellular foamed article with bulk density of at least 0.02 g/cm³ comprising a terpolymer of

(i) ethylene;
(ii) 10 to 40 percent by weight of a softening monomer selected from the group consisting of alkyl acrylates and methylacrylates having linear or branched alkyl groups of 1 to 18 carbon atoms, vinyl esters of saturated carboxylic acids having 1 to 18 carbon atoms and vinyl alkyl ethers wherein the alkyl group contains 1 to 18 carbon atoms; and
(iii) 1.0 to 20 percent by weight carbon monoxide.

4,394,460
ETHYLENE-CHLOROTRIFLUOROETHYLENE COPOLYMER FOAM

Daniel C. Chung, Middlesex; William A. Miller, Bridgewater, and Eugene R. Baumgaertner, Florham Park, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 213,716, Dec. 8, 1980, Pat. No. 4,331,619. This application Dec. 4, 1981, Ser. No. 327,326
Int. Cl.³ C08J 9/08, 9/10
U.S. Cl. 521—92 34 Claims

1. A composition comprising:
a copolymer of ethylene and chlorotrifluoroethylene, the copolymer having between 40 and 60 mol percent of ethylene units and correspondingly between about 60 and about 40 mol percent of chlorotrifluoroethylene units;
an effective amount of a blowing agent selected from the group consisting of hydrozodicarboxylates, diesters of azodiformic acid and carbazides; and
at least one nucleating agent selected from the group consisting of talc, magnesium carbonate, calcium carbonate, barium carbonate, zinc carbonate, lead carbonate, magnesium oxide, calcium oxide, barium oxide, zinc oxide and lead oxide.

4,394,461
AZOCARBOXYLATE BLOWING AGENT

Paul E. Stott, Houston, Tex., assignor to Uniroyal, Inc., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,101
Int. Cl.³ C08J 9/10
U.S. Cl. 521—113 10 Claims

1. A foamable and curable polyester composition consisting essentially of, all parts by weight (unless otherwise indicated):
(a) 100 parts liquid unsaturated polyester resin;
(b) 0.1–10 parts azocarboxylate of the formula

$$(R^3)_m(N{=}NCOO)_y(M^1)_x$$

wherein M is a metal; x is the valence of R and is 1–6, y is the valence of M and is 1–4, and mx=ny=p where p=1–24; and R is:
(1) A, a mono- or polyvalent radical: C_1–C_{10} alkyl, haloalkyl; C_5–C_6 cycloalkyl; C_7–C_9 aralkyl; C_7–C_9 alkaryl; phenyl, halophenyl; naphthyl; C_4–C_{10} oxydialkylene oxydiphenylene; or
(2) $COOM^1$, where M^1 is the same as or different from M, or
(3) $COOR^1$ where R^1 is A; or
(4) COR^2, where R^2 is A or NH_2
(c) 0.1–4.0 parts hydrogen peroxide, organic peroxide or organic hydroperoxide,
(d) 0.1–20 parts proton donor
(e) 3–1000 ppm, based on metal, of metal promoter,
(f) 0–2.0 parts surface active agent, and
(g) 0–250 parts filler.

4,394,462
MIXTURES OF POLYMERS FOR MEDICAL USE

Christian Pusineri, Serezin du Rhone, and Jean Goletto, Ecully, both of France, assignors to Hospal-Sodip, S.A., Meyzieu, France

Division of Ser. No. 103,894, Dec. 17, 1979. This application Sep. 13, 1982, Ser. No. 417,323
Int. Cl.³ C08J 9/14
U.S. Cl. 521—137 1 Claim

1. Process for the preparation of a foamed composition having good compatibility with biological materials consisting of a mixture of vinyl chloride polymer and a polyether-urethane with tertiary amine and/or ammonium groups with the proportion of the polyether-urethane being from 1 to 99 percent by weight, relative to the total mixture, on a blowing agent or a solvent in an inadequate amount to solubilise the total amount of the composition, and in that this paste is then extruded at a temperature below 100° C. to foam said mixture of polymers.

4,394,463
RIGID POLYURETHANE FOAMS MADE FROM AMINO POLYOLS MODIFIED WITH EPOXY RESINS

Michael Cuscurida; Neal J. Grice, and George P. Speranza, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 183,558, Sep. 2, 1980, Pat. No. 4,309,532. This application Aug. 3, 1981, Ser. No. 289,560
Int. Cl.³ C12P 5/02
U.S. Cl. 521—167 2 Claims

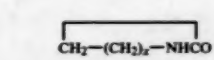
1. An improved rigid polyurethane foam produced by the reaction of a modified amino polyol, an organic polyisocyanate and one or more foam catalysts where in the improvement comprises making the modified amino polyol by the reaction of components comprising
(a) a rigid foam polyol initiator having an active hydrogen functionality equal to or greater than four,
(b) an amine,
(c) one or more alkylene oxides and
(d) an epoxy resin.

4,394,464
MODIFIED POLYIMIDE FOAMS AND METHODS OF MAKING SAME

John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120, and John V. Long, 1756 E. Lexington Pl., El Cajon, Calif. 92021

Filed Jun. 21, 1982, Ser. No. 390,778
Int. Cl.³ C08J 9/22, 9/24, 9/32
U.S. Cl. 521—180 13 Claims

1. The method of making a resilient, flame resistant modified polyimide foam which comprises the steps of:
reacting an aromatic dianhydride with an oximine having the general formula:



wherein "X" is an integer from 2 to 4, in a mole ratio of oximine to dianhydride between about 1.5:1 and about 0.05:1 to produce an N-substituted aliphatic imide;
dissolving said imide in a reactive solvent esterifying agent to exterify said imide;

adding thereto a diamine;
drying the resulting solution; and
heating the dry material to a selected foaming temperature of from about 120° C. to about 320° C. for a period of from about 10 to about 60 minutes;
whereby a resilient foam having good flame resistance is produced comprising polyimide and polyimide-amide with proportions depending on the selected foaming temperature.

4,394,465

DENTAL MATERIALS BASED ON ORGANIC PLASTICS IN PASTE FORM

Wolfgang Podszun, Cologne; Michael Walkowiak, Leverkusen, and Hans-Hermann Schulz, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 5, 1980, Ser. No. 184,570
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1979, 2938875
Int. Cl.³ A61K 6/08; C08K 3/36, 3/40
U.S. Cl. 523—116 14 Claims

1. A dental material which is based on organic plastics and is in paste form, characterized in that it comprises (a) 18 to 50% by weight of a polymerisable binder, (b) 20 to 65% by weight of a crosslinked bead polymer with an average particle size of 5 to 100 μm and (c) 5 to 45% by weight of glass beads with an average particle size of 5 to 80μ.

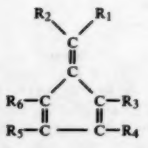
4,394,466

FULVENE BINDER COMPOSITIONS

Bruce A. Gruber, Worthington; Heimo J. Langer, and William R. Dunnavant, both of Columbus, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 174,970, Aug. 4, 1980, Pat. No. 4,320,218. This application Nov. 10, 1981, Ser. No. 320,026
Int. Cl.³ C08K 5/09
U.S. Cl. 523—141 19 Claims

1. A molding composition which comprises a major amount of aggregate and an effective bonding amount up to about 40% by weight of the aggregate of a composition capable of curing in the presence of oxygen containing a fulvene of the formula:



wherein each R_1 and R_2 individually is hydrogen or a hydrocarbon containing 1 to 10 carbon atoms, or a hydrocarbon containing one or more oxygen bridges in the chain; or a furyl group; or are interconnected to form a cyclic group, each R_3 and R_6 individually is hydrogen or methyl, each R_4 and R_5 is hydrogen or methyl or

provided that a maximum of only one such R_3, R_4, R_5 and R_6 is methyl and provided that a maximum of any one such R_4 and R_5 is

or prepolymer thereof or mixtures thereof; and a catalytic amount of a metal salt of a carboxylic acid catalyst wherein the metal constituent of said salt of a carboxylic acid is capable of existing in at least two valence states.

4,394,467

SIZED CARBON FIBERS CAPABLE OF USE WITH POLYIMIDE MATRIX

Robert Edelman, Staten Island, N.Y., assignor to Celanese Corporation, New York, N.Y.

Filed Jun. 22, 1981, Ser. No. 276,108
Int. Cl.³ B32B 5/00, 27/06; D02G 3/00
U.S. Cl. 523—205 26 Claims

1. A carbon fiber having a flexible coating on the surface thereof in a concentration of approximately 0.3 to 5.0 percent by weight based upon the weight of the carbon fiber of a sizing composition which comprises a polyamic acid oligomer, and is capable of yielding a rigid polyimide at elevated temperatures which is derived from the reaction of at least one aromatic diamine, at least one aromatic dianhydride, and at least one aromatic tetracarboxylic acid diester in which the carboxylic acid groups and ester groups are ortho disposed, wherein said polyamic acid oligomer is an intermediate in the formation of said rigid polyimide.

4,394,468

FIBER REINFORCED POLYOXYMETHYLENE MOLDING COMPOSITIONS

Shau-Zou Lu, Whitehouse Station, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Feb. 3, 1982, Ser. No. 345,287
Int. Cl.³ C08L 71/02; C08F 3/40; C08J 3/20
U.S. Cl. 523—205 10 Claims

1. An improved fiber reinforced polyoxymethylene molding composition comprising the admixture of:
(i) a polyoxymethylene polymer; and
(ii) an effective amount of a fibrous reinforcement, wherein said fibrous reinforcement is surface treated with a vinyl polymer which is selected from the group consisting of polyvinylacetate, copolymers of vinyl acetate and other ethylenically unsaturated monomers and partially hydrolyzed vinyl acetate polymer.

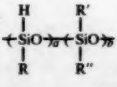
4,394,469

POLYSILOXANE TREATED ANTIMONY COMPOUNDS

Julius J. Stratta, Yorktown Heights, N.Y.; Lloyd M. Robeson, White House Station, N.J., and Richard V. Girardi, Mahopac, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

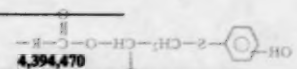
Filed Mar. 29, 1982, Ser. No. 363,103
Int. Cl.³ C08K 9/06
U.S. Cl. 523—212 18 Claims

1. An inorganic antimony compound surface modified with up to about 10 percent by weight of a polysiloxane having the formula:



wherein R, R′ and R″ are individually alkyl, alkenyl, aryl, alkylaryl, alkoxy, ether, ester, carboxyl, or amino groups hav-

ing from 1 to 18 carbon atoms, and a + b equals from 2 to 1,000 provided a/b is greater than 0.5.



4,394,470

COLORED POLYETHYLENE TEREPHTHALATE MOULDING COMPOUND AND MOULDED PRODUCTS MADE THEREFROM

Marcel A. Werner, Huissen; Arnold Venema, and Michael G. H. Pisters, both of Arnhem, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Mar. 19, 1982, Ser. No. 359,846

Claims priority, application Netherlands, Mar. 20, 1981, 8101373

Int. Cl.³ C08K 5/15

U.S. Cl. 524—56 16 Claims

1. A coloured polyethylene terephthalate moulding compound, characterized in that in the moulding compound there is uniformly distributed 10–25000 ppm of caramel.

4,394,471

COMPOSITIONS OF ALKYLENE-ALKYL ACRYLATE COPOLYMERS HAVING IMPROVED FLAME RETARDANT PROPERTIES

Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 127,509, Mar. 5, 1980, abandoned, which is a continuation-in-part of Ser. No. 944,336, Sep. 21, 1978, Pat. No. 4,243,579. This application Feb. 11, 1981, Ser. No. 232,480

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.³ C08K 5/34, 3/26, 3/22, 3/30

U.S. Cl. 524—92 22 Claims

1. A flame retardant alkylene-alkyl acrylate copolymer composition comprising an alkylene-alkyl acrylate copolymer, from about 1 to 30 weight percent of a halogenated flame retardant additive, and more than 20, up to about 30 weight percent of at least one of calcium or magnesium oxide, carbonate, hydroxide or sulfate; said weight percents based on the total weight of the composition.

4,394,472

STABILIZED POLYISOPRENE COMPOSITION

Tadahiko Ito; Toshio Arao; Nobuo Satoh, and Hiroshi Harada, all of Ibaraki, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1981, Ser. No. 332,827

Claims priority, application Japan, Dec. 25, 1980, 184540

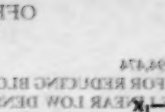
Int. Cl.³ C08K 5/34, 5/52

U.S. Cl. 524—100 9 Claims

1. A stabilized polyisoprene composition comprising 100 parts by weight of polyisoprene and 0.15–3.0 parts by weight of a binary system antioxidant consisting of a phosphite type antioxidant represented by the formula:

wherein R_1, R_2 and R_3, which may be the same or different, represent aryl or alkaryl groups having 6 to 33 carbon atoms, and

a triazine derivative type antioxidant represented by the formula



wherein X_1, X_2 and X_3, which may be the same or different, are selected from the group consisting of —NH—, —O—, and —S—, and R', R'', and R''', which may be the same or different, represent alkyl groups having 2 to 15 carbon atoms, or alkyl-substituted or unsubstituted hydroxyphenyl groups having 1 to 10 carbon atoms in the alkyl group,

or 2,4,6-tris (3',5'-di-t-butyl-4'-hydroxyphenylethoxy)-1,3,5-trizaine,

wherein the weight ratio of the phosphite type antioxidant to the triazine derivative type antioxidant is 70/10–95/5.

4,394,473

RUBBER COMPOUNDING BAGS AND FILM MADE FROM SYNDIOTACTIC 1,2-POLYBUTADIENE

John P. Winter, and Mladomir Tomic, both of Appleton, Wis., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Oct. 6, 1981, Ser. No. 309,046

Int. Cl.³ B65D 25/08; C08F 36/00

U.S. Cl. 524—226 42 Claims

1. A package which comprises (A) an article selected from at least one of unvulcanized or vulcanized rubber or compounding ingredients for unvulcanized rubber packaged in (B) a bag or film made of syndiotactic 1,2-polybutadiene containing at least one antiblock agent additive and also containing at least one slip agent additive selected from the group consisting of fatty acids and metal salts thereof, fatty acid amides, and ester waxes and partially saponified products thereof, the thickness of said bag or film being in the range of about 0.5 to about 10 mils.

19. A method of compounding rubber which comprises mixing unvulcanized rubber with a package comprising at least one compounding ingredient for unvulcanized rubber packaged in a coextruded bag or film made of syndiotactic 1,2-polybutadiene containing at least one antiblock agent additive and also containing at least one slip agent additive selected from the group consisting of fatty acids and metal salts thereof, fatty acid amides, and ester waxes and partially saponified products thereof, the total thickness of said bag or film being in the range of about 0.5 to about 10 mils, said coextruded bag or film comprising at least an inside layer and an outside layer, said inside layer being comprised of syndiotactic 1,2-polybutadiene containing a greater amount of one or more of said antiblock agents than the outside layer.

37. A compounded rubber comprised of a mixture of an unvulcanized rubber and a package comprising at least one compounding ingredient for unvulcanized rubber packaged in a coextruded bag or film made of syndiotactic 1,2-polybutadiene containing at least one antiblock agent additive and also containing at least one slip agent additive selected from the group consisting of fatty acids and metal salts thereof, fatty acid amides, and ester waxes and partially saponified products thereof, the total thickness of said bag or film being in the range of about 0.5 to about 10 mils, said coextruded bag or film comprising at least an inside layer and an outside layer, said inside layer being comprised of syndiotactic 1,2-polybutadiene containing a greater amount of one or more of said antiblock agents than the outside layer.

4,394,474

PRODUCT AND PROCESS FOR REDUCING BLOCK AND INCREASING SLIP OF LINEAR LOW DENSITY ETHYLENE COPOLYMER FILMS

Osborne K. McKinney, and David P. Flores, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 21, 1981, Ser. No. 256,268
Int. Cl.³ C08K 5/16; B29D 7/02
U.S. Cl. 524—232 14 Claims

1. A process for reducing block, and increasing slip, of extrusion-cast films of linear low density ethylene copolymers which inherently exhibit high block and low slip, said process comprising

incorporating into the said copolymer, prior to extrusion-casting into films, an effective amount in the range of about 0.05 to about 1.5 weight percent of at least one secondary fatty acid amide and about 0.02 to about 2 weight percent of finely-divided natural mineral, and

extrusion-casting the mixture into a thin film,

wherein the linear low density ethylene copolymer comprises ethylene copolymerized with a sufficient amount of at least one alpha, beta-ethylenically unsaturated alkene having from 3 to 12 carbons, to provide a copolymer having a density in the range of about 0.90 to about 0.94 gms. cc,

said copolymers having a melt index in the range of about 0.1 gm./10 min. as measured by ASTM-D-1238(E) to about 20 gms./10 min. as measured by ASTM-D-1238(D).

13. The film produced by the process of claim 1, having an average thickness in the range of about 0.3 to about 8 mils.

4,394,475

AQUEOUS SIZING COMPOSITION FOR PRODUCING SIZED GLASS FIBER STRANDS WITH IMPROVED SLIP FLOW PROPERTIES

Chester S. Temple, McKees Rocks, and Ed C. Hsu, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 24, 1981, Ser. No. 334,202
Int. Cl.³ C08K 5/54
U.S. Cl. 524—262 15 Claims

1. In an aqueous sizing composition for treating glass fibers, having one or more film forming polymers, one or more coupling agents and one or more lubricants or any mixture thereof, and water the improvement comprising:

(a) the one or more film forming polymers are nonstarch film forming polymers that provide integrity to the glass fibers, and the aqueous composition also has:

(b) a polyethylene-containing polymer where the polyethylene has limited branching with a polydispersity index of less than 10 which is present in an amount of about 0.1 to about 10 weight percent of the aqueous sizing composition, and

(c) a wax having a melting point greater than 50° C. present in the aqueous sizing composition in an amount of about 0.1 to about 6 weight percent of the aqueous sizing composition, where the weight ratio of polyethylene-containing polymer to wax is about 25:1 to about 1:25 and the amount of the polyethylene and wax in an aqueous sizing composition does not exceed about 15 weight percent of the aqueous sizing composition.

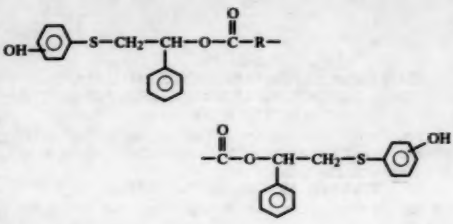
4,394,476

DIESTER ANTIOXIDANTS

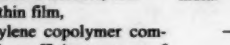
Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 243,323, Mar. 13, 1981, abandoned.
This application Jul. 9, 1982, Ser. No. 396,935
Int. Cl.³ C08K 5/13
U.S. Cl. 524—289 5 Claims

1. A polymer susceptible to oxidative degradation having incorporated therein a stabilizing amount of a compound having the following structural formula:



wherein R is an alkylene radical containing 2 to 10 carbon atoms, a phenylene radical, or a radical of the structural formula:



4,394,477

COATING COMPOSITION

James B. Screeton, Heathfield House, Lynstead, Nr. Sittingbourne, Kent, England

Filed Oct. 29, 1981, Ser. No. 316,358
Claims priority, application United Kingdom, Oct. 30, 1980, 8034934
Int. Cl.³ C08K 5/09
U.S. Cl. 524—319 8 Claims

1. A coating composition comprising a pigment component dispersed in a binder component, wherein the pigment component contains in particular form both a white mineral pigment and a laminar solid and the binder component substantially consists of a copolymer selected from a vinyl acetate veo va copolymer and a vinyl acetate laureate copolymer dissolved in an alcohol.

4,394,478

OXIDIZED CARBONACEOUS MATERIALS AND VULCANIZED AND VULCANIZABLE RUBBER COMPOSITIONS REINFORCED WITH SUCH CARBONACEOUS MATERIALS

Jon W. Martin, Los Alamitos, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jun. 29, 1981, Ser. No. 278,921
Int. Cl.³ C08K 3/18, 3/10
U.S. Cl. 524—424 3 Claims

1. A composition comprising a major amount of diene rubber and a minor amount of oxidized carbonaceous material comprising carbon in an amount of about 80% to about 99%; oxidized iron dispersed in, intimately associated with and at least partially bonded to the carbon in an amount of about 1% to about 15%; and hydrogen in an amount of about 0.1% to about 1.5% by weight.

4,394,479

VINYL ACETATE INTERPOLYMER LATICES

Irving Serlin, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1980, Ser. No. 218,994
Int. Cl.³ C08F 2/24; C08L 29/04
U.S. Cl. 524—459 20 Claims

1. An aqueous latex consisting essentially of a partially neutralized acid-modified interpolymer of a C_4–D_6 vinyl ester and a protective colloid, wherein the vinyl ester interpolymer comprises from about 3 to about 7 weight percent of carboxylic acid groups supplied by an interpolymerized C_4–C_{10} vinylene monobasic carboxylic acid monomer, wherein the neutral-

izing agent is a volatile base, wherein the concentration of protective colloid is less than about 0.8 parts by weight per 100 parts by weight of the interpolymer and wherein the particle size of the latex is in the range of from 0.05 to about 0.5 microns.

12. A method of preparing an aqueous latex consisting essentially of a partially neutralized acid-modified interpolymer of a C_4–C_6 vinyl ester and a protective colloid, wherein the vinyl ester interpolymer comprises from about 3 to about 7 weight percent of carboxylic acid groups supplied by an interpolymerized C_4–C_{10} vinylene monobasic carboxylic acid monomer, wherein the neutralizing agent is a volatile base, wherein the concentration of protective colloid is less than about 0.8 parts by weight per 100 parts by weight of the interpolymer and wherein the particle size of the latex is in the range of about 0.05 to about 0.5 microns, said method comprising:

A. interpolymerizing the vinyl ester and vinylene monobasic carboxylic acid monomer in aqueous suspension at a pH in the range of about 6.0 to about 6.2 in the presence of the protective colloid while adding incrementally sufficient of the volatile base to neutralize from about 10 to about 30 percent of the vinylene monobasic carboxylic acid monomer; and

B. adjusting the pH of the interpolymer suspension to a value in the range of about 6.2 to about 7.5 and agitating the interpolymer suspension to form the latex.

4,394,480

LOW SHRINKAGE UNSATURATED POLYESTER RESIN COMPOSITION

Norihisa Ujikawa, and Kyosuke Fukushi, both of Aichi, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

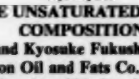
Filed Mar. 24, 1982, Ser. No. 361,168

Claims priority, application Japan, Apr. 1, 1981, 56-048769

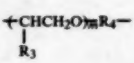
Int. Cl.³ C08L *67/06*

U.S. Cl. 525—43 **16 Claims**

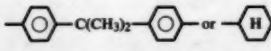
1. A low-shrinkage unsaturated polyester resin composition comprising (a) from 20 to 70% by weight of unsaturated polyester resin, (b) from 20 to 70% by weight of a first polymerizable monomer and (c) from 1 to 20% by weight of a block copolymer mixture having acid groups, said block copolymer mixture having been prepared by first copolymerizing (i) a polymeric peroxide having the formula



wherein R_1 is alkylene or substituted alkylene having 1 to 18 carbon atoms, cycloalkylene or substituted cycloalkylene having 3 to 15 carbon atoms, phenylene or substituted phenylene; R_2 is alkylene or substituted alkylene having 2 to 10 carbons atoms,



wherein R_3 is hydrogen or methyl, R_4 is alkylene or substituted alkylene having 2 to 10 carbon atoms and m is an integer of 1 to 13,



and n is an integer of 2 to 20, with (ii) a second monomer component selected from the group consisting of monomer A, monomer B, mixture of monomer A and an unsaturated organic acid, and mixture of monomer B and an unsaturated organic acid,

wherein monomer A consists of 70 to 100% by weight of vinyl acetate and up to 30% by weight of fourth monomer copolymerizable with vinyl acetate, and monomer B consists of 0 to 100% by weight of one or more styrene series monomers and 0 to 100% by weight of one or more unsaturated organic acid esters,

whereby to obtain a copolymer having peroxy bonds in the molecule, and then block copolymerizing said copolymer having peroxy bonds in the molecule with a third monomer component which is selected from the same group as, but is different from, the said second monomer component that was used in the first copolymerization step, with the provisos that one of said second and third monomer components is a mixture of one of monomer A or monomer B and said unsaturated organic acid and the other of said second and third monomer components is the other of monomer A or monomer B.

4,394,481

CATIONIC ARCYLAMIDE AND RUBBER MODIFIED ASPHALTS

Anthony V. Grossi, Newark; Leon A. Hagelee, Minerva Park; Louis T. Hahn, and Alfred Marzocchi, both of Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 11, 1981, Ser. No. 329,902

Int. Cl.³ C08F *289/00*; C08G *83/00*; C08H *5/00*

U.S. Cl. 525—54.5 **21 Claims**

14. A chemically modified asphalt reaction product produced by charging into a reactor an acrylamide having a double bond, asphalt, a vinyl aromatic monomer, and a rubbery polymer which is a homopolymer of a diene or a copolymer of a diene and an olefinically unsaturated monomer and heating the materials at an elevated temperature for several hours so as to produce said reaction product.

4,394,482

MODIFIED ASPHALT COMPOSITION

William E. Uffner, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 167,985, Jul. 14, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,124

Int. Cl.³ C08L *95/00*

U.S. Cl. 525—54.5 **16 Claims**

1. A chemically modified asphalt composition comprising (1) an asphalt which has been reacted with a polymerizable vinyl aromatic monomer and a rubbery polymer and (2) a terpene resin, said terpene resin being present in an amount sufficient to reduce the viscosity of said reacted asphalt.

4,394,483

SAPONIFICATION OF ETHYLENE COPOLYMERS SUSPENDED IN KETONE

Victor J. Hobes, Dinslaken, and Wolfgang Payer, Wesel, both of Fed. Rep. of Germany, assignors to Ruhechemie Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,565

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046144

Int. Cl.³ C08F *8/12*

U.S. Cl. 525—60 **9 Claims**

1. In a process for the production of ethylene copolymers comprising by weight

(1) more than 60% polyethylene,

(2) 0 to 20% polyesters of C_3 to C_{12} alkenecarboxylic acids with C_1 to C_8 primary alcohols,

(3) 1 to 20% C_3 to C_{12} polyalkenecarboxylic acids, ps comprising saponifying a feedstock comprising by weight a granular polymer or

(a) at least 50% ethylene,

(b) 2 to 50% esters of C_3 to C_{12} alkenecarboxylic acids with C_1 to C_8 primary alcohols,

(c) 0 to 30% vinyl esters of saturated monobasic, aliphatic carboxylic acids with 1 to 6 carbon atoms, and

(d) up to 3% C_3 to C_{12} alkenecarboxylic acids,

the improvement which comprises said feedstock having a particle size of 0.1 to 8.0 mm, and being suspended in a liquid phase consisting essentially of a ketone, there being 1 part of said feedstock to 1–10 parts of said ketone, said ketone being of the formula

wherein R and R^1 are individually a straight or branched chain alkyl radical having 1 to 6 carbon atoms, and

carrying out the saponification of the polyester of alkenecarboxylic acids with primary alcohols at 40° to 75° C. in the presence of at least one alkaline saponifying agent, while retaining the granular structure thereof.

4,394,484

POLYPENTABROMOSTYRENE, PROCESS FOR THE PRODUCTION AND USE

Herbert Jenkner, Pulheim; Robert Strang, Cologne, and Peter Adermann, Rösrath, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Kalk GmbH, Cologne, Fed. Rep. of Germany

Filed Jul. 7, 1981, Ser. No. 280,979

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1980, 3025666

Int. Cl.³ C08F *112/04*

U.S. Cl. 525—72 **9 Claims**

1. Polypentabromostyrene having a bromine content of between 76% and 80% and a softening point above 280° C. and which is thermally decomposed at a temperature of above 400° C.

2. A process for preparing polypentabromostyrene having a bromine content of between 76% and 80% and a softening point above 280° C. and which is thermally decomposed at a temperature of 400° C., comprising heating pentabromostyrene to a temperature of 100° C. to 150° C. in an alcoholic solvent having a boiling point of above 100° C. in the presence of an effective amount of a polymerization catalyst.

4,394,485

FOUR COMPONENT ADHESIVE BLENDS AND COMPOSITE STRUCTURES

Ashok M. Adur, Rolling Meadows, Ill., assignor to Chemplex Company, Rolling Meadows, Ill.

Filed Mar. 31, 1982, Ser. No. 363,894

Int. Cl.³ C08L *51/06, 23/26*

U.S. Cl. 525—74 **11 Claims**

1. A modified polyolefin blend consisting essentially of:

(A) HDPE having a density of about 0.94–0.97 g/cc;

(B) at least one polypropylene polymer or copolymer;

(C) LDPE having a density of about 0.91–0.94 g/cc; and

(D) a polyethylene polymer grafted with at least one grafting monomer polymerizable ethylenically unsaturated carboxylic acid or acid derivative.

4,394,486

HIGH SOLIDS COATINGS WITH ENHANCED FLEXIBILITY AND IMPACT STRENGTH

Mohinder S. Chattha, Livonia, and Ares N. Theodore, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1981, Ser. No. 334,684

Int. Cl.³ C08L *61/28, 37/00*

U.S. Cl. 525—162 **40 Claims**

1. A thermosetting coating composition exhibiting improved flexibility and impact strength and having excellent weatherability and comprising:

(A) a modified hydroxy acrylic copolymer which is the stepwise reaction product of:

(i) a copolymer bearing pendant hydroxyl groups and having a number average molecular weight (M_n) of between about 1000–5000, said copolymer being prepared from (a) between about 5 and about 40 weight percent of monoethylenically unsaturated hydroxy alkyl ester of the formula $CH_2{=}CR_1{-}COOR_2$ wherein R_1 is H or an alkyl group and R_2 is a hydroxy alkyl group and (b) between about 95–60 weight percent of other monoethylenically unsaturated monomers;

(ii) dicarboxylic acid anhydride comprising at least about 50 percent by weight of an alkyl hexahydrophthalic anhydride, wherein (i) and (ii) are reacted in an amount sufficient to esterify between about 30 and about 100 percent of said pendant hydroxyl groups of said copolymer thereby generating pendant carboxyl groups; and

(iii) a monoepoxide functional monomer comprising at least about 90 percent by weight C_2–C_{10} monoepoxide functional monomers, wherein said monomer is reacted with said pendant carboxyl groups of the polymer reaction product of (i) and (ii) in an amount so as to provide at least about 1.0 equivalent of epoxide groups per equivalent of said pendant carboxyl groups to generate pendant hydroxyl groups;

(B) an amine-aldehyde crosslinking agent;

(C) 0–50 weight percent based on the total weight of (A), (B) (C) and (D) of a hydroxy functional additive having a number average molecular weight (M_n) of between about 150 and about 6000; and

(D) solvent said amine-aldehyde crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.60 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxyl functionality included in said composition either as a hydroxyl group on said modified hydroxy acrylic copolymer or as a hydroxyl group on said hydroxy functional additive.

4,394,487

ADSORBENT FOR THE AFFINITY-SPECIFIC SEPARATION OF MACROMOLECULAR MATERIALS

Werner Müller, Bielefeld, and Hans Bünemann, Steinhagen, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Division of Ser. No. 880,914, Feb. 24, 1978, Pat. No. 4,335,226.

This application Oct. 7, 1981, Ser. No. 309,543

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1977, 2709094

Int. Cl.³ C08F *267/10, 8/00*

U.S. Cl. 525—281 **7 Claims**

1. Process for the preparation of an adsorbent for the affinity-specific separation of nucleic acids, comprising a polymeric carrier material onto which an affine residue group consisting of a base and/or structure specific complex former for nucleic acids, is covalently bound wherein said polymeric carrier material is first formed from at least one monomer which additionally possesses a functional group via which the affine residue for the biopolymer can be bound directly or via a polymeric spacer, the polymeric carrier material is optionally comminuted to the desired particle size and then the affine residue for the biopolymer is grafted on either directly or by copolymerization in the presence of at least one further monomer as co-monomer so that particles of the desired size are produced.

4,394,488

ZINC PEROXIDE PROCESS

Chan J. Kim, and Ahti A. Koski, both of Sarnia, Canada, assignors to Polysar Limited, Ontario, Canada

Filed Jul. 20, 1982, Ser. No. 400,008

Claims priority, application Canada, Aug. 10, 1981, 383563

Int. Cl.³ C08J 3/24; C08C 19/04; C08F 236/12; C08C 19/42

U.S. Cl. 524—432 9 Claims

1. A process for the production of a mixture of butadiene-acrylonitrile polymer and zinc peroxide which comprises: (I) forming an aqueous mixture in a reactor equipped with means for agitation and means for temperature control, said aqueous mixture comprising (a) from about 15 to about 30 weight percent of zinc oxide made by the French Process being at least about 99 weight percent pure and having an average particle size of from about 0.1 to about 0.5 micron, (b) from about 0.0075 to about 0.2 parts by weight of sulphuric acid per part by weight of zinc oxide, (c) from about 1 to about 5 moles of hydrogen peroxide per mole of zinc oxide, and (d) the balance to 100 weight percent being water, said aqueous mixture being formed by adding said zinc oxide to a preformed mixture in said reactor of said sulphuric acid, said hydrogen peroxide and said water while maintaining the contents of said reactor in an agitated condition and at a temperature of from about 20° to about 35° C. throughout the addition of said zinc oxide and then for a further time of from about 1 to about 4 hours, thereby producing an aqueous slurry of a mixture of zinc peroxide and zinc oxide containing less than about 0.05 weight percent of residual hydrogen peroxide; and (II) transferring said aqueous slurry to a mixing vessel, adding thereto and mixing therewith a stream of an aqueous latex of a butadiene-acrylonitrile polymer, said polymer containing from about 20 to about 45 weight percent acrylonitrile and having a molecular weight characterized by a Mooney (ML 1+4 at 100° C.) of from about 35 to about 65, contacting the resulting mixture with an aqueous stream of calcium chloride to coagulate said mixture, separating said coagulated product from the aqueous phase, recovering and drying said product to a water content of less than about 1 weight percent to yield a final product containing from about 48 to about 57 weight percent of said polymer and from about 43 to about 52 weight percent of said mixture of zinc peroxide and zinc oxide wherein said final product contains at least about 27.5 weight percent zinc peroxide.

4,394,489

FLUOROELASTOMER CURATIVES

Carl A. Aufdermarsh, Newark, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Feb. 25, 1982, Ser. No. 352,328

Int. Cl.³ C08F 4/72

U.S. Cl. 525—370 7 Claims

1. In a nitrile-substituted fluoroelastomer composition containing a curing agent, the improvement wherein the curing agent comprises about from 1 to 10 parts per 100 parts by weight of elastomer of an organotin compound having the general formula R_xSnY_{4-x} wherein x is 0–3, R is aryl of 6–10 carbon atoms or alkyl of 1–4 carbon atoms, and Y is at least one of allyl, propargyl, and allenyl.

4,394,490

WATER DISPERSIBLE POLYESTER COMPOSITIONS

William C. T. Tung, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 28, 1982, Ser. No. 425,146

Int. Cl.³ C08F 283/00; C08G 63/76; C08L 63/00

U.S. Cl. 525—438 10 Claims

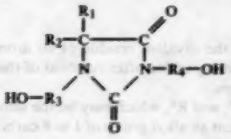
1. A water dispersible polyester, comprising:

a polyester, said polyester comprising a mixture of units in the polymer chain made from the reaction product of a diacid component and a diol,

said diacid component comprising up to 30 mole percent by weight of a compound selected from the group consisting of an alkyl dicarboxylic acid having from 4 to 20 carbon atoms, a diester of an alkyl dicarboxylic acid having from 6 to 20 carbon atoms, and combinations thereof, at least 70 mole percent of an aromatic dicarboxylic acid or ester thereof selected from the group consisting of an aryl dicarboxylic acid having from 8 to 20 carbon atoms, an alkyl substituted aryl dicarboxylic acid having from 9 to 20 carbon atoms, a diester of an alkyl substituted aryl dicarboxylic acid having from 11 to 20 carbon atoms, a diester of an aryl dicarboxylic acid having from 10 to 20 carbon atoms, and combinations thereof;

said diol comprising up to 30 mole percent of a diol selected from the group consisting of a glycol having from 2 to 12 carbon atoms, a glycol ether having from 4 to 12 carbon atoms, or combinations thereof, said diol component also having at least 70 mole percent of

a hydantoin compound having the formula



wherein R_1 and R_2 can be the same or different and is an alkyl having from 1 to 2 carbon atoms, and where R_3 and R_4 can be the same or different and is an alkyl having from 1 to 4 carbon atoms.

8. A water dispersible polyester according to claim 1, 2, 4, 5, or 7, wherein said dispersible polyester has been cured by a curing agent, so that said polyester is water insoluble.

9. A water dispersible polyester according to claim 8, wherein said curing agent is an epoxy compound.

4,394,491

ADDITION POLYMERIZABLE ADDUCT OF A POLYMERIC MONOAHL AND AN UNSATURATED ISOCYANATE

Dwight K. Hoffman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 8, 1980, Ser. No. 195,135

Int. Cl.³ C08L 71/02, 75/08

U.S. Cl. 525—452 9 Claims

1. An ethylenic addition polymerizable adduct of a monoahl and an active ethylenically unsaturated isocyanate monomer, said monoahl being an organic compound containing only one active hydrogen moiety capable of reacting with the isocyanate moiety of the isocyanate monomer to form the adduct, said adduct being represented by the formula:

$$Y-(R'''A)_m-R'''-Z$$

wherein each A is individually —O—, —S— or

wherein R_1 is hydrogen or alkyl; Y is oxyalkyl or oxyaryl; Z is an oxycarbonylaminoalkyl ester of an α,β-ethylenically unsaturated carboxylic acid; each R''' is individually alkylene, arylene hydroxyalkylene, aminoalkylene, alkoxyalkylene, aryloxyalkylene, arylalkylene, hydroxyarylalkylene or haloalkylene; and m is a whole number such that $-(-R'''A-)_m-R'''-$ has a number average molecular weight from about 60 to about 100,000 and being capable of stabilizing a dispersion of a polymer comprising the adduct in a continuous liquid phase.

4,394,492

CURING EPOXIDE RESINS IN AN AQUATIC ENVIRONMENT

Christopher M. Andrews, Cambridge, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,466

Claims priority, application United Kingdom, Jun. 30, 1981, 8120155

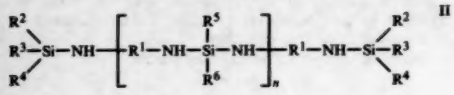
Int. Cl.³ C08L 61/00, 61/06

U.S. Cl. 525—504 8 Claims

1. Curable compositions comprising

(a) an epoxide resin and

(b) a silamine of the formula



II

where

R^1 represents the divalent residue of an aromatic or araliphatic diprimary amine after removal of the two primary amino groups,

R^2, R^3, R^4, R^5, and R^6, which may be the same or different, each represent an alkyl group of 1 to 8 carbon atoms or an aryl group of 6 to 10 carbon atoms,

and

n represents zero or an integer of from 1 to 10.

4,394,493

CROSSLINKABLE POLY(OXYALKYLENE) GRAFT COPOLYMERS

David J. Bartkovitz, North Tarrytown, and George H. Greene, Croton-on-Hudson, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1981, Ser. No. 307,211

Int. Cl.³ C08F 283/06

U.S. Cl. 525—530 2 Claims

1. A graft copolymer of N-(isobutoxymethyl)acrylamide and a poly(oxyalkylene) having up to about 70 percent by weight of said N-(isobutoxymethyl)-acrylamide grafted onto a poly-(oxyalkylene) polymer having the formula:

$$R''[(OC_nH_{2n})_zOR']_a$$

wherein R'' is a hydrocarbon radical containing up to 10 carbons having a valence of a, a is an integer having a value from 1 to 4, R' is a hydrogen atom or a monovalent hydrocarbon radical containing up to 6 carbons, n has a value of 2 to 4, and z is an integer having a value of about 2 to about 800, wherein said graft copolymer is crosslinkable and film formable.

4,394,494

DENTAL FILLING MATERIAL

Mikio Miyake, Yamanishi; Shinya Kitoh, and Satoshi Hayashi, both of Hiratsuka, all of Japan, assignors to Lion Corporation, Tokyo, Japan

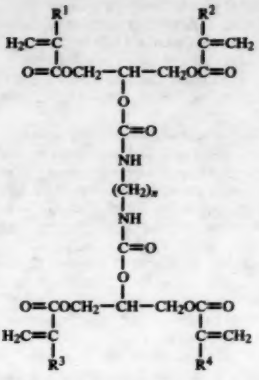
Filed Jun. 22, 1981, Ser. No. 275,704

Claims priority, application Japan, Jul. 4, 1980, 55-91408; Nov. 12, 1980, 55-158982

Int. Cl.³ A61K 6/02; C08F 26/02; C07C 125/06

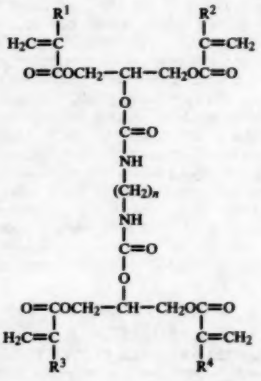
U.S. Cl. 526—301 19 Claims

1. A polymerizable monomer having the formula:



wherein R^1, R^2, R^3 and R^4 are each hydrogen or a methyl group and n is equal to a value varying from 2 to 10.

2. A dental filling composition, comprising: a polymerizable monomer having the formula I:



wherein R^1, R^2, R^3 and R^4 are each a hydrogen ora methyl group and n is equal to a value varying from 2 to 10 and a filler material.

4,394,495

DIISOCYANATES USEFUL AS A STRUCTURAL COMPONENT IN THE PREPARATION OF POLYURETHANE PLASTICS

Hans-Joachim Scholl, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

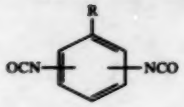
Filed Jan. 29, 1982, Ser. No. 344,120

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1981, 3105776

Int. Cl.³ C08G 18/76

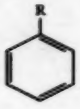
U.S. Cl. 528—67 2 Claims

1. A mixture of homologues and isomers of diisocyanates corresponding to the formula:



in which R represents a saturated, straight-chained aliphatic hydrocarbon radical having 8 to 15 carbon atoms prepared by

(a) dinitrating a mixture of homologues and isomers of hydrocarbons corresponding to the formula



which mixture, at 1013 mbar, has a boiling range according to ASTM D 86 of 10°–50° C. within the temperature range of from 270°–330° C.;

(b) hydrogenating the product of (a) to form a mixture of diamino compounds; and

(c) phosgenating the diamino compounds of (b).

4,394,496

EPOXIDATION PRODUCTS OF 1,1,1-TRI-(HYDROXYPHENYL) ALKANES

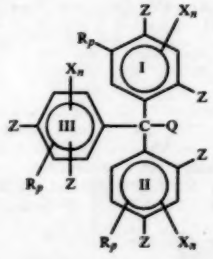
Paul G. Schrader, Antioch, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 234,237, Feb. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 906,384, May 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 646,730, Jan. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 173,259, Aug. 19, 1971, abandoned. This application Oct. 30, 1981, Ser. No. 316,586

Int. Cl.³ C08G *59/32*

U.S. Cl. 528—98 **33 Claims**

1. The epoxidation product of a phenolic compound of the formula



(A)

wherein:

Q is H or an alkyl group of from 1 to about 10 carbon atoms;

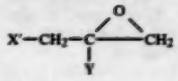
each R independently represents an alkyl group of from 1 to about 12 carbon atoms, phenyl or cycloalkyl of from 3 to about 6 carbon atoms;

each Z independently represents H or OH, with the proviso that at least one Z group on each of Rings I, II and III is OH;

each X independently represents bromo, chloro or nitro;

each p independently is 0, 1 or 2, each n independently is 0, 1, or 2, the sum of n+p for each ring being 0, 1, 2 or 3 when each Z is other than hydrogen,

and an epihalohydrin of the formula:



(B)

wherein X′ is Cl or Br and Y is H or —CH_3;

said epoxidation product having an average epoxide functionality of from about 2.5 to about 6.0, or at least about 70% of theoretical for the number of available hydroxyls, whichever is greater.

23. The cured epoxidation product of claim 1.

4,394,497

SOLID MATERIALS PREPARED FROM EPOXY RESINS AND PHENOLIC HYDROXYL-CONTAINING MATERIALS

Donald L. Nelson, and Bryan A. Naderhoff, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 29, 1982, Ser. No. 362,799

Int. Cl.³ C08G *59/00, 65/14*

U.S. Cl. 528—101 **9 Claims**

1. Solid compositions resulting from reacting, in the presence of an effective quantity of a suitable catalyst,

(I) at least one material having an average of more than one 1,2-epoxy group per molecule with

(II) at least one material having an average of more than one phenolic hydroxyl group per molecule;

wherein at least one of (I) or (II) contains with respect to (II) or has been prepared from with respect to (I) a reaction product of

(A) at least one aromatic compound containing (1) at least one aromatic ring, (2) at least one aromatic hydroxyl group and (3) which aromatic ring has at least one ortho or para position capable of being alkylated, and

(B) at least one unsaturated aliphatic or cycloaliphahtic hydrocarbon containing 4 to 6 carbon atoms or one or more dimers or oligomers thereof, or mixtures thereof.

4,394,498

METHOD FOR PROVIDING PARTICULATES OF LIQUID CRYSTAL POLYMERS AND PARTICULATES PRODUCED THEREFROM

John R. Kastelic, Rockaway, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,339

Int. Cl.³ B29D *27/00*; C08G *63/18*; B02C *11/08*

U.S. Cl. 528—193 **26 Claims**

1. A method of providing particulates of a polymer which is capable of forming an anisotropic melt phase and suitable for use in a thermally and chemically resistant coating which method comprises providing a foamed melt of said polymer, forming an article comprised of said polymer which contains a multitude of voids, and masticating said article to an extent sufficient to form particulates of said polymer.

24. Particulates of a polymer produced by the method of claim 1 which exhibit a length to diameter ratio of less than about 10:1 and a maximum cross-sectional dimension of less than about 100 microns.

4,394,499

POLYIMIDE RESINS

Joseph G. Robinson, Winchcombe, and David I. Barnes, Cheltenham, both of England, assignors to Coal Industry (Patents) Limited, London, England

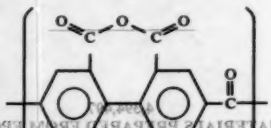
Filed Aug. 4, 1981, Ser. No. 290,089

Claims priority, application United Kingdom, Aug. 22, 1980, 8027411

Int. Cl.³ C08G 73/10

U.S. Cl. 528—229 **10 Claims**

1. An improved phenanthrene based polyimide resin comprising a reaction product of (1) diphenic anhydride oligomers comprising two to about six moieties of



and (2) from 0.1 to 0.6 of an equivalent quantity of an aromatic primary diamine and from 0.9 to 0.4 of an equivalent quantity of a monofunctional primary amine or ammonia.

4,394,500

BEAD POLYMERIZATION PROCESS FOR PREPARING POLYBENZIMIDAZOLE

George N. Milford, Jr., Waynesboro, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 7, 1981, Ser. No. 290,865

Int. Cl.³ C08G 69/04

U.S. Cl. 528—313 **5 Claims**

1. Process for the preparation of polybenzimidazole in the form of small particles from at least one aromatic compound selected from the group consisting of o-diamino-substituted carboxylic acid compounds by contacting at least one o-diamino-substituted carboxylic acid compound with an excess of polyphosphoric acid dehydrating agent in an inert, nonsolvent, liquid medium, heating to 120°-230° C. for 1-4 hours with stirring, cooling to room temperature with continued stirring and filtering to remove polybenzimidazole which is washed to remove impurities.

4,394,501

COMPOSITION FOR PREVENTING PLATE OUT IN EXTRUSION EQUIPMENT

Walfrida G. E. Knibers-Kiewit, Hengelo; Johannes Akkerman, le Dedemsvaart, and Johan Gons, AA Dedemsvaart, all of Netherlands, assignors to Wavin B.V., Zwolle, Netherlands

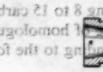
Filed Feb. 4, 1981, Ser. No. 231,271

Claims priority, application Netherlands, Apr. 2, 1980, 8000690; Nov. 19, 1980, 8006314

Int. Cl.³ C08K 3/34

U.S. Cl. 528—485 **4 Claims**

1. A plastic composition incorporating additives to prevent plate out on molding tools and extruders consisting essentially of particles of polymers of vinylchloride and vinylidene chloride and copolymers thereof and additives selected from the group comprising stabilizers and lubricating agents wherein at least one of said stabilizers and lubricating agents is a metal compound, free of liquids and blowing agents, and a drying agent capable of binding water at temperatures greater than 120° C. and pressures greater than 10 atmospheres and capable of preventing ionization of hydrochloric acid at said temperatures and pressures, said drying agent being an expanded and finely ground aluminum silicate.



4,394,502

IMMUNOTHERAPEUTIC AGENT FOR TUMORS COMPRISING LIPOPOLYSACCHARIDE AS AN ACTIVE COMPONENT

Chisato Maruyama, No. 20-6, 1-chome, Mukogaoka, Bunkyo-ku, Tokyo-to, Japan

Continuation-in-part of Ser. No. 147,127, May 6, 1980, Pat. No. 4,329,452. This application Aug. 18, 1981, Ser. No. 293,999

Claims priority, application Japan, Jul. 4, 1979, 54-84681

The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.

Int. Cl.³ C08B 37/00; A61K 31/72; C07H 13/02

U.S. Cl. 536—119 **5 Claims**

1. An immunotherapeutic agent for tumors, which comprises as an effective component lipopolysaccharide comprising, arabinomannan as a polysaccharide and fatty acids bonded to said arabinomannan through an ester linkage, the fatty acid content in said lipopolysaccharide being 3 to 28%, said lipopolysaccharide being obtained by hot water extraction and purification of the cell body of human tubercle bacillus, *Mycobacterium tuberculosis* strain Aoyama B or *Mycobacterium tuberculosis* strain $H_{37}R_v$.

4,394,503

CEPHALOSPORIN DERIVATIVES

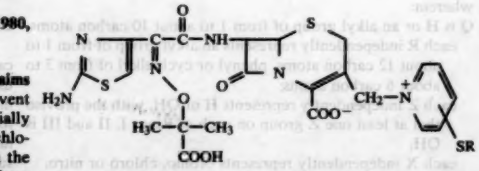
Hajime Kamachi, Ciba; Jun Okumura, Yokohama; Takayuki Naito, Kawasaki, and Masahisa Oka, Yokoyama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,331

Int. Cl.³ C07D 501/38; A61K 31/545

U.S. Cl. 544—25 **4 Claims**

1. A compound of the formula



I

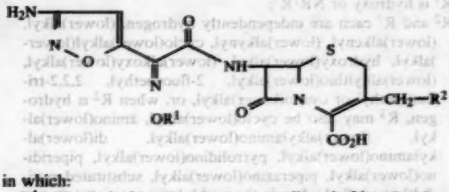
wherein R is methyl, ethyl or isopropyl, or a pharmaceutically acceptable salt, physiologically hydrolyzable ester or solvate thereof.

4,394,504
CEPHALOSPORIN DERIVATIVES

Thomas J. Commons, Wayne, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 7, 1981, Ser. No. 309,361
Int. Cl.³ C07D 501/34
U.S. Cl. 544—28 3 Claims

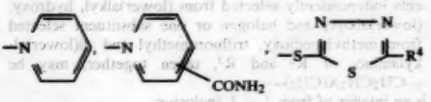
1. A compound of the formula:



in which:

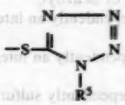
R^1 is H, alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkynyl of 2 to 4 carbon atoms, arylalkyl of 7 to 10 carbon atoms, 2-carboxyprop-2-yl, carboxymethyl, alkanoyl of 2 to 4 carbon atoms or α-phenylalkanoyl of 8 to 10 carbon atoms;

R^2 is H, hydroxy, alkanoyloxy of 2 to 6 carbon atoms, carbamoyloxy,



where

R^4 is hydrogen or alkyl of 1 to 4 carbon atoms or



where

R^5 is hydrogen or alkyl of 1 to 4 carbon atoms, vinyl, sulfonyloxymethyl or carboxymethyl;

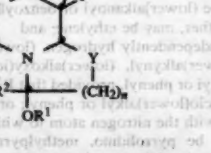
or a pharmaceutically acceptable salt thereof.

4,394,505
5-FLUOROURACIL DERIVATIVES

Susumu Kamata, Takarazuka, and Wataru Nagata, Nishinomiya, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Apr. 16, 1982, Ser. No. 369,110
Claims priority, application Japan, Apr. 28, 1981, 56-64738
Int. Cl.³ C07D 487/04, 498/04, 513/04
U.S. Cl. 544—91 5 Claims

1. A compound of the formula



wherein

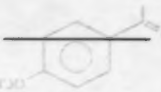
R^1 is hydrogen, C_1–C_5alkyl, C_6–C_{10}aryl, C_7–C_{10}aralkyl, C_1–C_{12}alkanoyl, C_2–C_5alkoxycarbonyl, C_1–C_5alkanoyloxymethyl, carbamoyl or tri-C_1–C_5alkylsilyl;

R^2 is hydrogen, C_1–C_5alkyl, C_6–C_{10}aryl or C_7–C_{10}aralkyl;

X is hydrogen, halogen or C_2–C_5alkoxycarbonyl;

Y is O, NR′ (R′ is hydrogen or C_1–C_5alkyl), S, SO or SO_2; and

n is an integer of 1–3.

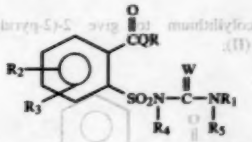


4,394,506
AGRICULTURAL SULFONAMIDES

George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 29,281, Apr. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 15,341, Mar. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 965,070, Nov. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 910,965, May 30, 1978, abandoned. This application Nov. 30, 1979, Ser. No. 98,781
Int. Cl.³ C07D 239/28, 239/30
U.S. Cl. 544—321 8 Claims

1. A compound of the formula



wherein

Q is O;

W is O;

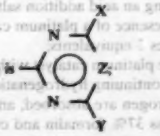
R is C_1–C_4 alkyl;

R_2 is H;

R_3 is H;

R_4 is H;

R_5 is H or CH_3;



X is H, CH_3, OCH_3 or OC_2H_5;

Y is H, Cl, CH_3, OCH_3 or OC_2H_5; and

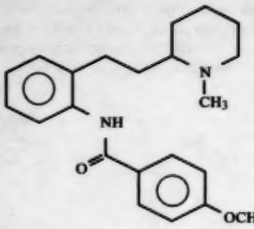
Z is CH.

4,394,507
PROCESS FOR PRODUCTION OF ENCAINIDE

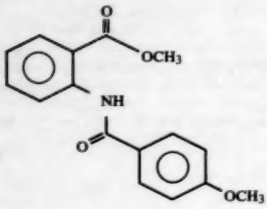
Gary D. Madding, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Filed Dec. 14, 1981, Ser. No. 330,298
Int. Cl.³ C07D 211/02, 211/34
U.S. Cl. 546—185 2 Claims

1. A process for preparing 4-methoxy-2′-[2-(1-methyl-2-piperidyl)ethyl]benzanilide (I), which comprises:

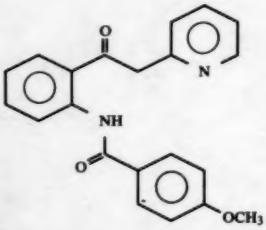


(a) reacting methyl N-p-anisoylanthranilate (III)



(III)

with 2-picolyllithium to give 2-(2-pyridylacetyl)-p-anisanilide (II);



(II)

(b) hydrogenating an acid addition salt of II in glacial acetic acid in the presence of a platinum catalyst until hydrogen uptake reaches 3 equivalents;

(c) replacing the platinum catalyst with palladium-on-carbon catalyst and continuing hydrogenation until 2 more equivalents of hydrogen are absorbed; and

(d) adding excess 37% formalin and continuing hydrogenation until hydrogen absorption ceases.

4,394,508

CHEMICAL COMPOUNDS

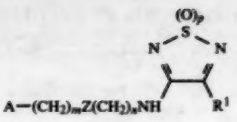
Ronnie R. Crenshaw, Dewitt, and Aldo A. Algieri, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 163,831, Jul. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 117,182, Jan. 31, 1980, abandoned, which is a continuation-in-part of Ser. No. 72,517, Sep. 4, 1979, abandoned. This application Mar. 3, 1981, Ser. No. 240,034

Int. Cl.³ C07D *417/12, 285/10*

U.S. Cl. 546—209 **58 Claims**

1. A compound of the formula



(I)

wherein

p is 1 or 2;

R^1 is hydroxy or NR^2R^3;

R^2 and R^3 each are independently hydrogen, (lower)alkyl, (lower)alkenyl, (lower)alkynyl, cyclo(lower)alkyl(lower-)alkyl, hydroxy(lower)alkyl, (lower)alkoxy(lower)alkyl, (lower)alkylthio(lower)alkyl, 2-fluoroethyl, 2,2,2-trifluoroethyl or cyano(lower)alkyl, or, when R^2 is hydrogen, R^3 may also be cyclo(lower)alkyl, amino(lower)alkyl, (lower)alkylamino(lower)alkyl, di(lower)alkylamino(lower)alkyl, pyrrolidino(lower)alkyl, piperidino(lower)alkyl, piperazino(lower)alkyl, substituted pyridyl(lower)alkyl wherein the pyridyl ring may contain one substituent selected from (lower)alkyl, (lower)alkoxy, hydroxy, amino and halogen, amino, (lower)alkylamino, di(lower)alkylamino, hydroxy, (lower)alkoxy, 2,3-dihydroxypropyl, cyano, amidino, (lower)alkylamidino, $A'—(CH_2)_{m'}Z'(CH_2)_{n'}—$, phenyl, phenyl(lower)alkyl, substituted phenyl or substituted phenyl(lower)alkyl, wherein the phenyl ring may contain one or two substituents independently selected from (lower)alkyl, hydroxy, (lower)alkoxy and halogen or one substituent selected from methylenedioxy, trifluoromethyl and di(lower)alkylamino; or R^2 and R^3, taken together, may be $—CH_2CH_2X(CH_2)_r—$;

r is an integer of from 1 to 3, inclusive;

X is methylene, sulfur, oxygen or N-R^4, provided that, when r is 1, X is methylene;

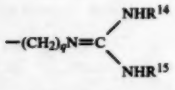
R^4 is hydrogen, (lower)alkyl, (lower)alkenyl, (lower)alkynyl, (lower)alkanoyl or benzoyl;

m and m′ each are independently an integer of from zero to 2, inclusive;

n and n′ each are independently an integer of from 2 to 4, inclusive;

Z and Z′ each are independently sulfur, oxygen or methylene;

A and A′ each are independently phenyl, imidazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl, thiadiazolyl, oxadiazolyl, furyl, thienyl or pyridyl; provided that A and A′ independently may contain one or two substituents, the first substituent being selected from (lower)alkyl, hydroxy, trifluoromethyl, halogen, amino, hydroxymethyl, (lower)alkoxy,



and $—(CH_2)_qNR^5R^6$, and the second substituent being selected from (lower)alkyl, hydroxy, trifluoromethyl, halogen, amino, hydroxymethyl and (lower)alkoxy;

q is an integer of from 0 to 6, inclusive; R^{14} and R^{15} independently are hydrogen or (lower)alkyl, or, if R^{14} is hydrogen, R^{15} also may be (lower)alkanoyl or benzoyl, or R^{14} and R^{15}, taken together, may be ethylene; and

R^5 and R^6 each are independently hydrogen, (lower)alkyl, (lower)alkenyl, (lower)alkynyl, (lower)alkoxy(lower)alkyl, cyclo(lower)alkyl or phenyl, provided that R^5 and R^6 may not both be cyclo(lower)alkyl or phenyl; or R^5 and R^6, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, piperidino, methylpiperidino, dime-

thylpiperidino, hydroxypiperidino, homopiperidino, heptamethyleneimino or octamethyleneimino;
or a nontoxic, pharmaceutically acceptable salt, hydrate, solvate or N-oxide thereof.

4,394,509

2-[(PHENYLTHIO)METHYL OR ETHYL]PYRIDINE DERIVATIVES

Roger Crossley, Reading, England, assignor to John Wyeth and Brother Limited, Maidenhead, England

Division of Ser. No. 232,452, Feb. 9, 1981, Pat. No. 4,327,102. This application Jan. 21, 1982, Ser. No. 341,430

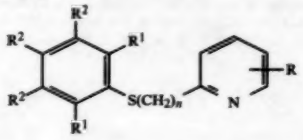
Claims priority, application United Kingdom, Feb. 20, 1980, 8005668; Feb. 20, 1980, 8005669

The portion of the term of this patent subsequent to Jun. 29, 1999, has been disclaimed.

Int. Cl.³ C07D *213/32, 213/44*

U.S. Cl. 546—339 **6 Claims**

1. A compound of formula II:



wherein R represents hydrogen or lower alkyl, R^1 represents hydrogen or fluorine, R^2 represents hydrogen, fluorine or chlorine, n is 1 or 2 and at least one of R, R^1 and R^2 is other than hydrogen, and the pharmaceutically acceptable salts thereof.

4,394,510

PROCESS FOR PREPARING AN ISOXAZOLYLUREA

Eddie V. P. Tao, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 2, 1981, Ser. No. 230,555

Int. Cl.³ C07D *261/14*

U.S. Cl. 548—240 **12 Claims**

1. A process for preparing 1-(5-t-butylisoxazol-3-yl)-3,3-dimethylurea without isolation of intermediates, consisting essentially of

(1) combining a C_1–C_6 alkyl pivalate with acetonitrile in the presence of sodium hydride, potassium t-butoxide or sodamide at from about 80° to about 110°, extracting the reaction mixture with water, acidifying the water layer, extracting the acidic water layer with an inert organic solvent, and extracting the organic layer with aqueous sodium hydroxide;

(2) combining the basic aqueous layer with hydroxylamine or a salt thereof, adjusting the pH of the mixture to from about 7.5 to about 8.5, and holding the mixture at from about 70° to about 100°, combining the mixture with from about 0.5 to about 2 moles of concentrated hydrochloric acid per mole of pivalate, holding the mixture at from about 50° to about 100°, combining the mixture with from about 1 to about 3 moles of concentrated hydrochloric acid per mole of pivalate, holding the mixture at from about 50° to about 100°, cooling the mixture, extracting the mixture with cyclohexane, making the aqueous layer basic with sodium hydroxide, cooling the basic mixture, extracting the mixture with ethyl acetate, and drying the organic layer;

(3) slowly adding the dried organic layer to a solution of phosgene in ethyl acetate at from about −25° to about 5°, holding the mixture at from about 60° to about 100°, and cooling the mixture;

(4) combining the cooled mixture with dimethylamine, holding the mixture at from about 60° to about 100°, cooling the mixture, neutralizing the mixture with aqueous acid, concentrating the organic layer to a volume of from about 180 to about 300 ml. per gram-mole of pivalate, adding the hot concentrated solution to water, cooling the mixture to from about 0° to about 10°, and separating the solid product.

4,394,511

IMIDAZOLE 4(5)-DITHIOCARBOXYLIC ACIDS OR SALTS

Natsuo Sawa, and Tokuichi Saeki, both of Kagawa, Japan, assignors to Shikoku Chemicals Corporation, Kagawa, Japan

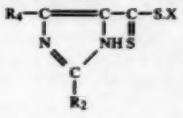
Filed Apr. 21, 1982, Ser. No. 370,354

Claims priority, application Japan, Apr. 23, 1981, 56/62240

Int. Cl.³ C07D *233/84*

U.S. Cl. 548—343 **13 Claims**

1. An imidazole-4(5)-dithiocarboxylic acid compound represented by the following general formula:



wherein R_2 stands for a hydrogen atom or a monovalent hydrocarbon group having up to 20 carbons, R_4 stands for a hydrogen atom or an alkyl group having up to 4 carbon atoms, and X stands for a hydrogen atom or an alkali metal atom.

4,394,512

1-(SUBSTITUTED PHENYL) AMINOANTIPYRIN COMPOUNDS

Hans-Georg Batz, Tutzing, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

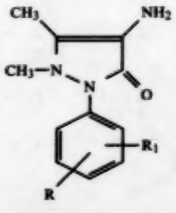
Filed Jan. 23, 1981, Ser. No. 228,011

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1980, 3004129; Oct. 7, 1980, 3039207; Jan. 13, 1981, 3100807

Int. Cl.³ C07D *231/46*

U.S. Cl. 548—365 **3 Claims**

1. A compound of the formula



wherein R represents the group $N(R_2)_2$, in which each R_2 is an alkyl group of 1 to 3 carbon atoms, or one R_2 is an acyl group of 1 to 3 and the other R_2 is an alkyl group of 1 to 3 carbon atoms, and R_1 has the same meaning as R or is a hydrogen atom or NH_2.

4,394,513

N-AZOLYL ACETANILIDES, THE MANUFACTURE THEREOF, AND THEIR USE AS

Karl Eicken, Wachenheim; Wolfgang Rohr, Mannheim, and Bruno Wuerzer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

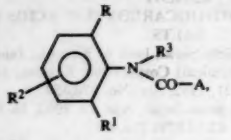
Filed Dec. 31, 1979, Ser. No. 108,541

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1979, 2901593

Int. Cl.³ C07D 403/12

U.S. Cl. 548—374 **3 Claims**

1. An N-azolylacetanilide of the formula



I

where R denotes hydrogen or C_1–C_4-alkyl; R^1 denotes hydrogen, C_1–C_4-alkyl or halogen; R^2 denotes hydrogen or methyl, R^3 denotes A; and A denotes N-azolylmethyl in which the heterocyclic ring of the N-azolylmethyl is a pyrazole, 1,2,4-triazole or imidazole ring which ring is unsubstituted or substituted by from one to three radicals selected from the group consisting of methyl, methoxy and chlorine, with the proviso that both of the heterocyclic rings cannot be imidazole.

4,394,514

PROCESSES FOR PREPARING 4-SUBSTITUTED INDOLES

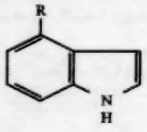
Lawrence I. Kruse, Haddonfield, N.J., assignor to SmithKline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 259,123, Apr. 30, 1981, abandoned. This application Jun. 29, 1981, Ser. No. 278,016

Int. Cl.³ C07D 209/04

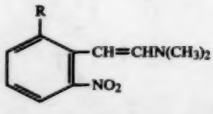
U.S. Cl. 548—508 **5 Claims**

1. The method of preparing a 4-substituted indole of the following formula:

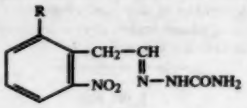


in which R is lower alkoxy, lower alkyl, benzyloxy or carbalkoxy, said alkoxy or alkyl groups being of 1–6 carbons, comprising the steps of;

(A) reacting a o-nitro-β-dimethylaminostyrene of the formula:



in which R is as defined above, with semicarbazide or an acid addition salt thereof at ambient temperature in aqueous dimethylformamide or dimethylacetamide until the reaction is substantially complete to give a semicarbazone of the formula



in which R is as defined above, and

(B) reacting said semicarbazone under standard low pressure catalytic hydrogenation conditions over a noble metal hydrogenation catalyst until the reaction is complete to give the desired 4-substituted indole.

4,394,515

10,11-DIHYDRO-11-OXODIBENZO[b,f]THIEPIN COMPOUNDS

Joshua Rokach, Chomedey-Laval, Canada; Clarence S. Rooney, Worcester, and Edward J. Cragoe, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 917,211, Jun. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 819,200, Jul. 26, 1977, abandoned. This application Apr. 6, 1981, Ser. No. 251,221

Int. Cl.³ C07D 337/14

U.S. Cl. 549—12 **2 Claims**

1. A compound which is 10,11-dihydro-11-oxodibenzo[b,f]-thiepin-3-carboxylic acid.

2. A compound which is 10,11-dihydro-11-oxodibenzo[b,f]-thiepin-3-carboxylic acid-5-oxide.

4,394,516

PROCESS FOR THE PREPARATION OF A FURAN DERIVATIVE

John W. Clitherow, Sawbridgeworth, England, assignor to Glaxo Group Limited, London, England

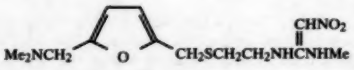
Filed May 7, 1982, Ser. No. 375,963

Claims priority, application United Kingdom, May 7, 1981, 8113944

Int. Cl.³ C07D 307/52

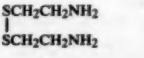
U.S. Cl. 549—495 **9 Claims**

1. A process for the preparation of ranitidine of formula (I)



(I)

which comprises reacting cystamine of formula (II)



(II)

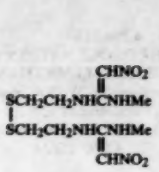
either with a nitroethenamine of formula (III)

(III)

where L is a leaving group, or with a compound of formula (IV)

(IV)

where L is a leaving group, followed by reaction with methylamine, to give a disulphide of formula (V)



(V)

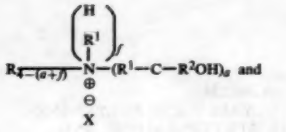
which is then reacted with 5-[(dimethylamino)methyl]-2-furanmethanol under acid conditions.

4,394,517
QUATERNARY AMMONIUM FUNCTIONAL SILICON COMPOUNDS

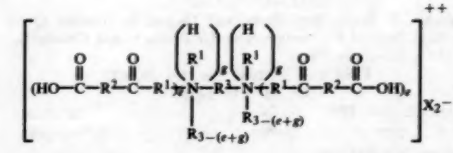
Eugene R. Martin, Onsted, Mich., and Jeffrey A. Tripp, Hillsdale, Australia, assignors to SWS Silicones Corporation, Adrian, Mich.

Filed May 21, 1982, Ser. No. 380,487
Int. Cl.³ C07F 7/10
U.S. Cl. 556—419 18 Claims

1. A process for preparing quaternary ammonium functional silicon compounds which comprises reacting a carboxylic acid functional quaternary ammonium compound selected from the group consisting of compounds having the formulas

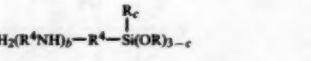


and

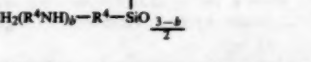


with an aminofunctional silicon compound selected from the group consisting of

(a) Silanes having the formula



(b) Siloxanes having at least one unit of the formula



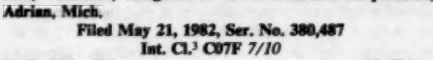
(c) and mixtures thereof, at a temperature of from 0° up to about 175° C., in which R is a monovalent hydrocarbon radical having from 1 to 22 carbon atoms, R^1 is a hydrocarbonoxy radical having the formula $-(C_nH_{2n}O)_r$, R^2 is a divalent hydrocarbon radical selected from the group consisting of $(CH_2)_y$, CH=CH and cyclic divalent hydrocarbon radicals selected from the group consisting of C_6H_4, C_6H_8, C_6H_{10}, and $C_{10}H_6$, R^3 is a divalent hydrocarbon radical having from 2 to 10 carbon atoms, R^4 is selected from the group consisting of a saturated divalent hydrocarbon radical having up to 10 carbon atoms, a divalent hydrocarbonoxy radical in which the oxygen is in the form of an ether linkage and an unsaturated divalent hydrocarbon radical having from 3 to 10 carbon atoms, X is an anionic radical, a is a number of from 1 to 4, b is 0, 1 or 2, c is 0, 1, 2 or 3, e is a number of from 1 to 3, f is a number of from 0 to 3, in which the sum of a+f cannot exceed 4, g is a number of from 0 to 2, in which the sum of e+g cannot exceed 3, n is 2, 3 or 4, r is a number of from 1 to 50 and y is a number of from 0 to 10.

4,394,518
ORGANIC FIBERS HAVING IMPROVED SLIP PROPERTIES

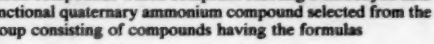
Peter Huber; Peter August; Helga Lampelzammer, all of Burghausen, and Willi Primas, Simbach, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 876,454, Feb. 9, 1978, abandoned. This application Dec. 31, 1979, Ser. No. 108,895
Int. Cl.³ C07F 7/10
U.S. Cl. 556—424 2 Claims

1. A polymeric organosilicon compound of the formula



wherein R is selected from the group consisting of hydrocarbon radicals and substituted hydrocarbon radicals having from 1 to 10 carbon atoms, D is a radical of the formula



where X is selected from the group consisting of

where R′ is hydrogen or R, R″ is a bivalent aliphatic hydrocarbon radical, A is selected from the group consisting of a bivalent aromatic hydrocarbon radical and a substituted bivalent aromatic hydrocarbon radical, M is a radical of the formula

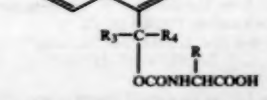
a is 0 or 1, b is 0, 1 or 2, c is 0 or a number of from 1 to 5, d is 0 or 1, m is 0 or a number of from 1 to 20, n is a number of from 1 to 1,000 with the proviso that at least one X_d—A—X_a—A radical is present per molecule in which a is 1.

4,394,519
AMINO ACID BLOCKING AGENTS

Louis A. Carpino, and Beri Cohen, both of Amherst, Mass., assignors to Research Corporation, New York, N.Y.

Filed Jan. 19, 1982, Ser. No. 342,296
Int. Cl.³ C07C 125/067
U.S. Cl. 560—32 9 Claims

1. A protected amino acid of the formula:



wherein R is an amino acid residue; R_3 and R_4 are each hydrogen, alkyl, aryl or aralkyl; R_5 is up to three hydrogen atoms, alkyl, aryl, alkaryl aralkyl, halogen or nitro; and R_6 is up to four hydrogen atoms, fused phenyl, alkyl, aryl, alkaryl, aralkyl, halogen or nitro; the alkyl, aryl, alkaryl or aralkyl group containing up to nine carbon atoms.

4,394,520

5-UREIDO-3-THIA HEXANEDIOIC ACID

Gregoire Kalopissis, Paris, France, assignor to Societe Anonyme dite: L'Oreal, Paris, France

Division of Ser. No. 871,839, Jan. 24, 1978, Pat. No. 4,204,064, which is a division of Ser. No. 714,004, Aug. 12, 1976, Pat. No. 4,085,217, which is a division of Ser. No. 501,615, Aug. 29, 1974, Pat. No. 3,976,781, which is a division of Ser. No. 203,046, Nov. 29, 1971, Pat. No. 3,849,576, which is a continuation-in-part of Ser. No. 736,960, Jun. 14, 1968, abandoned, which is a continuation-in-part of Ser. No. 427,976, Jan. 25, 1965, abandoned, and Ser. No. 602,480, Dec. 19, 1966, abandoned, Ser. No. 794,363, Jan. 27, 1969, abandoned, Ser. No. 801,840, Feb. 24, 1969, abandoned, Ser. No. 817,193, Apr. 17, 1969, abandoned, Ser. No. 858,161, Sep. 15, 1969, Pat. No. 3,671,643, Ser. No. 12,122, Feb. 17, 1970, abandoned, and Ser. No. 36,405, May 11, 1970, abandoned. This application Dec. 31, 1979, Ser. No. 108,829

Claims priority, application France, Jan. 29, 1964, 64 961897; Luxembourg, Dec. 22, 1965, 50125; France, Jun. 21, 1967, 67 111396; Jul. 28, 1967, 67 116160; Luxembourg, Jan. 29, 1968, 55371; Feb. 23, 1968, 55553; Feb. 19, 1969, 58042; Apr. 19, 1969, 55935; Belgium, Jun. 3, 1969, 74877; Luxembourg, May 12, 1969, 58634; Apr. 23, 1971, 63056; Apr. 23, 1971, 63057

Int. Cl.³ C07C *149/437*

U.S. Cl. 562—557 1 Claim

1. 5-ureido-3-thia hexanedioic acid.

4,394,521

PROCESS FOR THE PRODUCTION OF THE SCHIFF'S BASES OF 2,6-DICHLORO-5-HYDROXY-ANILINE

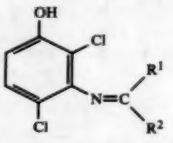
Reinhard Sappelt, Meersburg, Fed. Rep. of Germany, assignor to Lonza-Werke G.m.b.H., Weil am Rhein, Fed. Rep. of Germany

Filed Apr. 28, 1981, Ser. No. 258,522

Int. Cl.³ C07C *119/10*

U.S. Cl. 564—271 25 Claims

1. Process for the production of 2,6-dichloro-5-hydroxy-anils having the formula:



wherein R^1 and R^2 are the same or different and each is an alkyl radical having 1 to 4 C atoms, comprising reacting 2,4-dichloro-3-aminophenol with a ketone having the formula:

$$R^1—CO—R^2$$

wherein R^1 and R^2 have the same meaning as above.

4,394,522

CATALYTIC HYDROGENATION OF DI(4-AMINOPHENYL)METHANE

Gary F. Allen, New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jun. 1, 1981, Ser. No. 268,979

Int. Cl.³ C07C *85/24*

U.S. Cl. 564—451 10 Claims

1. A process for the catalytic hydrogenation of di(4-aminophenyl)methane to a liquid di(4-aminocyclohexyl)methane containing from 15% to 40% by weight of the trans, trans isomer comprising hydrogenating di(4-aminophenyl)methane in the presence of an unsupported ruthenium dioxide catalyst under a hydrogen pressure of at least 2500 psi and at a temperature of from 150° to 210° C.

4,394,523

CATALYTIC HYDROGENATION OF DI (4-AMINOPHENYL) METHANE

Gary F. Allen, New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jun. 1, 1981, Ser. No. 269,200

Int. Cl.³ C07C *85/24*

U.S. Cl. 564—451 15 Claims

1. A process for the catalytic hydrogenation of di(4-aminophenyl)methane to a liquid di(4-aminocyclohexyl)methane containing from 15% to 40% by weight of the trans, trans isomer comprising hydrogenating di(4-aminophenyl)methane in the presence of (i) a ruthenium-on-alumina catalyst (ii) at least 25% by weight of an aliphatic alcohol selected from the group consisting of methanol, ethanol, n-propanol, and isopropanol, based on the weight of the total weight of the di(4-aminophenyl)methane and the alcohol, and (iii) ammonia, the amount of ammonia present being such that the molar ratio of ammonia to di(4-aminophenyl)methane is from 0.5:1 to 10:1, the hydrogenation being conducted at a hydrogen pressure of at least 500 psi, at a temperature of from 150° C. to 217° C., and for a time not exceeding 60 minutes.

4,394,524

PREPARATION OF POLYALKYLENE POLYAMINES FROM AMMONIA, ALKYLENEAMINE, AND ALKANOLAMINE

Michael E. Ford, Trexlertown, and Thomas A. Johnson, Orefield, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

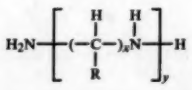
Filed Aug. 31, 1981, Ser. No. 297,687

Int. Cl.³ C07C *85/06*

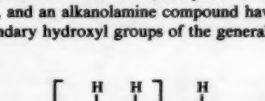
U.S. Cl. 564—479 22 Claims

1. A process for preparing a noncyclic polyalkylene polyamine which comprises:

contacting ammonia, an alkyleneamine compound having two primary amino groups of the general formula:



wherein R is hydrogen or a lower alkyl (C_1–C_4) radical, x is a number from 2 to about 6, and y is a number from 1 to about 4, and an alkanolamine compound having primary or secondary hydroxyl groups of the general formula:



wherein R is hydrogen or a lower alkyl (C_1–C_4) radical, x is a number from 2 to about 6, and y is a number from 0 to about 3; in the presence of an effective amount of a phosphorus-containing substance or a salt of a sulfur-containing substance, or the corresponding acid, at a temperature sufficient to effect reaction between the ammonia, the alkyleneamine compound and the alkanolamine compound under a pressure sufficient to maintain the reaction mixture essentially in liquid phase.

4,394,525

PROCESS FOR HYDROGENATING ALDEHYDES

Roger F. Vogel, Butler; George Marcelin, Pittsburgh, and Harold E. Swift, Gibsonia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jun. 29, 1981, Ser. No. 278,821
Int. Cl.³ C07C 45/62
U.S. Cl. 568—462 23 Claims

1. A process for hydrogenating an aliphatic aldehyde having from two to 20 carbon atoms which comprises contacting the same with hydrogen in the presence of a catalyst composed of about three to about 60 weight percent nickel mounted on an amorphous support containing (1) at least one Group IIA metal compound selected from the group consisting of magnesium, calcium, strontium and barium compounds, (2) alumina and (3) aluminum phosphate, such support having an average pore radius of from about 10 A to about 300 A, a surface area ranging from about 80 m^2/g to about 350 m^2/g and a pore volume of from about 0.33 cc/g to about 1.5 cc/g, said Group IIA metal compound being present in an amount ranging from about two to about 35 mole percent, alumina in an amount ranging from about 15 to about 60 mole percent and aluminum phosphate in an amount ranging from about 25 to about 80 mole percent wherein said unsaturated organic compound is passed over said catalyst at a liquid hourly space velocity of about 1.0 to about 12 while maintaining in the reaction zone a temperature of about 30° to about 200° C. and a hydrogen partial pressure of about 0 to about 500 pounds per square inch gauge.

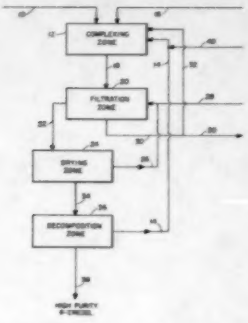
4,394,526

PARA-CRESOL HALIDE SALT COMPLEX USEFUL FOR SEPARATING PARA-CRESOL FROM META-CRESOL

Gerd Leston, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 53,438, Jun. 29, 1979, Pat. No. 4,267,389. This application Sep. 26, 1980, Ser. No. 191,203
Int. Cl.³ C07C 37/68, 37/66
U.S. Cl. 568—716 5 Claims

1. A complex between para-cresol and an anhydrous or dehydrated inorganic halide salt selected from the group consisting of calcium bromide, magnesium chloride, lithium bromide and manganese bromide, said complex formed in the presence of meta-cresol and a non-aqueous solvent.



4,394,527

METHOD FOR THE LIQUID PHASE OXIDATIVE FLUORINATION OF AROMATIC COMPOUNDS

Robert G. Fischer, Jr., Fairfield, and Arnold Zweig, Westport, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 22, 1979, Ser. No. 87,135
Int. Cl.³ C07C 17/12
U.S. Cl. 570—143 4 Claims

1. A process for monofluorinating a benzene nucleus which comprises: reacting at a temperature ranging from about 25° C. to about 100° C. in the liquid phase a benzene compound with argentic fluoride in the range of from about 0.1 mol to about 1 mol per mol of said benzene compound, said compound being dissolved in an inert solvent therefor present in amounts ranging from about 99% to 50% solvent and the remainder being said benzene compound for a time sufficient to convert said argentic fluoride to argentous fluoride, and recovering said fluorinated benzene compound in good yield and purity.

4,394,528

HIGH ENERGY FUEL COMPOSITIONS

Dennis H. Fisher, Westerville, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 8, 1981, Ser. No. 271,451
Int. Cl.³ C10L 1/04
U.S. Cl. 585—14 4 Claims

1. A composite high density fuel having a net heat of combustion of at least 140,000 BTU/gal., a flash point between 140° and 150° F. and a viscosity not in excess of about 30 cps at 0° F.; said fuel consisting essentially of (a) 35–90 wt. % of an isomeric mixture of tetrahydromethylcyclopentadiene dimers conforming to the physical property specifications for RJ-4; (b) 10–40 wt. % exo-tetrahydrodicyclopentadiene; and (c) 0–30 wt. % of the hydrogenated derivatives of a co-trimer of cyclopentadiene and methyl cyclopentadiene or a trimer of cyclopentadiene.

4,394,525

PROCESS FOR HYDROGENATING ALDEHYDES

Roger F. Vogel, Butler; George Marcello, Pittsburgh, and Harold E. Swift, Gibsonia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jan. 29, 1981, Ser. No. 229,811

Int. Cl.³ C07C 45/50

U.S. Cl. 568—462

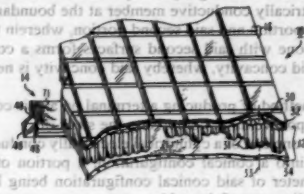
1. A process for hydrogenating aldehydes containing from two to 20 carbon atoms per molecule with hydrogen in the presence of a catalyst consisting essentially of about three to about 20 weight percent of a nickel-containing component, from about 10 to about 30 weight percent of a copper-containing component, from about 0.1 to about 10 weight percent of a chromium-containing component and from about 0.1 to about 10 weight percent of a barium-containing component, said catalyst having been prepared by a process comprising the steps of (a) forming a mixture of a nickel-containing component, a copper-containing component, a chromium-containing component and a barium-containing component, (b) heating said mixture at a temperature sufficient to decompose the nickel-containing component, the copper-containing component, the chromium-containing component and the barium-containing component to their oxides, (c) reducing the oxides of nickel, copper, chromium and barium to their metallic state, and (d) passivating the reduced catalyst by contacting the reduced catalyst with a gaseous mixture containing oxygen and an inert gas, wherein the concentration of oxygen in the gaseous mixture is increased from about 0.1 to about 5 mole percent over a period of time sufficient to increase the temperature of the catalyst by no more than about 50° C. above the temperature of the catalyst prior to the introduction of the oxygen-containing gaseous mixture, said hydrogenation being carried out at a temperature in the range of from about 100° C. to about 200° C. and at a pressure in the range of from about 100 to about 1000 psig.

4,394,529

SOLAR CELL ARRAY WITH LIGHTWEIGHT SUPPORT STRUCTURE

Raj N. Gounder, Robbinsville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 5, 1981, Ser. No. 290,176
Int. Cl.³ H01L 31/04; B32B 27/04
U.S. Cl. 136—245 14 Claims



5. A solar generator comprising:

a composite structural sheet member including at least one layer of epoxy-reinforced polyparabenzamide woven fabric,

a plurality of epoxy-reinforced carbon fiber stiffener elements secured to one side of said sheet member, said elements having a long axis, and

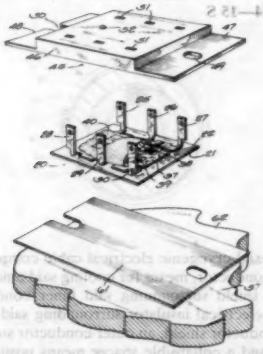
an array of solar cells secured to a surface of said layer, wherein said stiffener elements in a direction parallel to said long axis, said sheet, and said solar cells all have effectively the same coefficient of thermal expansion.

4,394,530

POWER SWITCHING DEVICE HAVING IMPROVED HEAT DISSIPATION MEANS

Lance R. Kaufman, 1821 W. Daisy La., Milwaukee, Wis. 53209

Filed Sep. 19, 1977, Ser. No. 834,601
Int. Cl.³ H01L 23/36
U.S. Cl. 174—16 HS 6 Claims



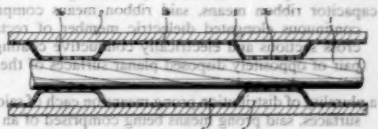
1. A power control assembly, comprising a solid state device including a heat generating portion, an electrically insulating thermally conductive substrate having a first side operatively connected in heat transfer relation to said heat generating solid state portion, a heat sink having an outer surface abutting a second substrate side spaced from said first side for dissipating heat from said solid state device, an electrically insulating housing having a first side including an outer wall surrounding an opening providing a recessed inner wall spaced from said outer wall with said substrate enclosing said opening and spaced from said inner wall to form a cavity about said solid state device, said inner wall including a terminal opening extending from said cavity to a second side of said housing, means for mechanically clamping said substrate to said heat sink, and electrical conductor means including a first conductive portion attached for electrical connection to said solid state device, said first conductive portion includes a thin bendable terminal strip portion extending from a conductive strip adhered to said first substrate side, said terminal strip portion including first and second parts with said first part substantially normally connected to said conductive strip and said second part substantially normally connected to said first part, and a second conductive portion extending through said terminal opening and including a conductive lead wire having a bare end soldered to said second part, said second conductive portion disposed within said terminal opening and maintained substantially normal to said substrate and providing external electrical access to said solid state device.

4,394,531

TRANSMISSION LINE ASSEMBLY INCLUDING MEANS FOR REDUCING VIBRATIONS AND METHOD OF MAKING SAME

Jacques J. A. Delabie, Bonneuil sur Marne, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", Paris, France

Filed Dec. 2, 1980, Ser. No. 212,127
Claims priority, application France, Dec. 3, 1979, 79 29922
Int. Cl.³ H01B 7/18; H02G 7/14; F16L 57/00
U.S. Cl. 174—24 12 Claims



1. A transmission line assembly including means for reducing transmission line vibration comprising:

an outer tubular sheath having an inner surface forming an inner diameter;

an inner tubular wall member firmly frictionally fixed to said inner surface of said outer tubular sheath;

a transmission line disposed within said inner tubular wall member for transmitting energy;

a plurality of radially contracted tubular sections having axial lengths at regularly spaced axial intervals formed in said inner tubular wall member and contiguously surrounding said transmission line for protecting, centering and supporting said transmission line within said outer tubular sheath; and

a plurality of radially enlarged sections formed in said inner tubular wall member having axial lengths greater than the axial lengths of said radially contracted tubular sections and having outer diameters radially compressed by said outer tubular sheath.

12. A method of manufacturing a transmission line assembly including means for reducing transmission line vibration, said assembly including a transmission line disposed within a thermoretractable plastic tube disposed within a tubular sheath, said transmission line having a smaller diameter than the inside diameter of said tube, wherein said method comprises:

inserting said transmission line into said tube;

heating said thermoretractable plastic tube at regular axial intervals so as to form a tubular wall member having tubular uncontracted sections and tubular contracted sections wherein said tubular contracted sections contiguously surround said transmission line; and

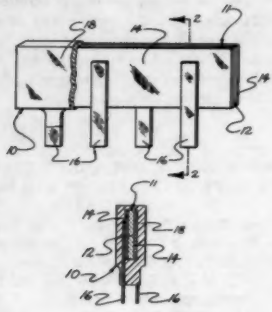
inserting said transmission line fitted with said tubular wall member into said sheath, said sheath having an inside diameter substantially the same as the outside diameter of said uncontracted sections of said tubular wall member for friction fitting engagement therewith.

4,394,532

MULTILAYER CURRENT DISTRIBUTION SYSTEMS AND METHODS OF FABRICATION THEREOF

Arturo J. Aguayo, Tempe, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Mar. 31, 1981, Ser. No. 249,393
Int. Cl.³ H01B 7/00
U.S. Cl. 174—72 B 5 Claims



1. A multilayer bus bar assembly including:
capacitor ribbon means, said ribbon means comprising a continuous elongated dielectric member of rectangular cross sections and electrically conductive coatings on a pair of oppositely disposed planar surfaces of the dielectric member; and
a plurality of distribution prong means on each of said planar surfaces, said prong means being comprised of an electrically conductive material, said prong means being mechanically and electrically bonded to respective coatings of said ribbon means.

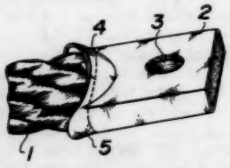
5. A method of forming a bus bar assembly including the following steps:
forming an elongated flat dielectric ceramic wafer having a rectangular cross-section;
applying a layer of conductive material to a pair of opposed surfaces of the flat ceramic wafer; and
electrically and mechanically bonding a plurality of transversely extending conductive distribution prongs to each of the conductive layers on the said opposed surfaces of the flat dielectric ceramic wafer.

4,394,533

AIR-COOLED CABLES WITH TERMINALS AND METHOD OF PRODUCING SAME

Mitsuo Naito, 1406, Haguro-cho, Kofu-shi, Yamanashi, Japan

Filed Jun. 17, 1981, Ser. No. 274,424
Claims priority, application Japan, Jun. 25, 1980, 55-85161
Int. Cl.³ H01R 4/18, 13/56
U.S. Cl. 174—74 R 5 Claims



1. A terminal in combination with an air-cooled cable employed in spot welding, said cable consisting of a plurality of non-insulated wires, said terminal comprising an electrically conductive member having first and second portions receiving an end of said cable, said first portion defining a concavity, said second portion being rectangular and extending from said first portion, said rectangular second portion having opposing first surfaces defining a height and opposing second surfaces defining a width, said width being greater than said height, said first portion forming a cone smoothly tapering into said second portion, the cable end being fixed within said rectangular portion, and a covering layer disposed between the cable and said electrically conductive member at the boundary between said first portion and said second portion, wherein the merger of said cone with said second surfaces forms a concave line facing said concavity, whereby said concavity is nearly circular.

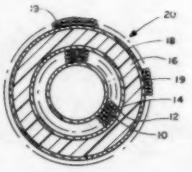
4. A method of producing a terminal on an air-cooled cable used in spot welding, comprising the steps of:
flaring one end of a cylindrical electrically conductive member into a conical configuration, a portion of the inner diameter of said conical configuration being larger than the diameter of the cable;
forming a covering layer only on a selected end portion of said cable;
inserting said cable end portion into said cylindrical electrically conductive member; and
pressing, into a rectangular configuration, said cylindrical electrically conductive member at a portion thereof including a part of said end flared into the conical configuration, whereby said cable end portion is fixed in said electrically conductive member and wherein said cable end portion is inserted such that said selected end portion is at a boundary between said flared end and said rectangular configuration.

4,394,534

CRYOGENIC CABLE AND METHOD OF MAKING SAME

George Bahder, Edison, N.J., and Mario Rabinowitz, Menlo Park, Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jan. 14, 1980, Ser. No. 111,808
Int. Cl.³ H01B 7/34
U.S. Cl. 174—15 S 7 Claims



1. A coaxial cryogenic electrical cable comprising an inner electrical conductor, means for cooling said inner conductor, a conductor shield surrounding said inner conductor, a solid polymeric electrical insulator surrounding said inner conductor and conductor shield, an outer conductor surrounding said insulator, and a collapsible spacer means positioned between said inner conductor and said conductor shield.

4,394,535

SPLIT PHASE STEREOPHONIC SOUND SYNTHESIZER

Joseph P. Bingham, Carmel, and John F. Benford, Indianapolis, both of Ind., assignors to RCA Corporation, New York, N.Y.

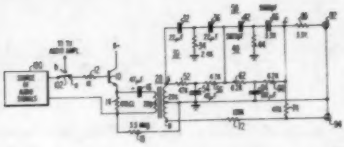
Filed Mar. 9, 1981, Ser. No. 241,926
Int. Cl.³ H04R 5/00; H04S 5/00
U.S. Cl. 179—1 GP 10 Claims

1. A stereo synthesizer for producing synthesized stereo sound signals from monophonic input signals comprising:
a source of monophonic sound signals;
a phase splitter circuit having an input coupled to said source of monophonic sound signals and first and second outputs

at which monophonic sound signals of opposite phase relationship are produced;

a transfer function circuit having an input coupled to said first output of said phase splitter circuit and an output, and exhibiting an amplitude versus frequency response characteristic including two spaced frequencies of maximum attenuation and a frequency of minimum attenuation intermediate said spaced frequencies within an audio frequency range occupied by said monophonic sound signals, for producing an intensity modulated signal at said transfer function circuit output;

a first output terminal responsive to said output of said transfer function circuit for producing a first synthesized stereo sound signal;



a second output terminal;

means for transferring monophonic sound signals from said second output of said phase splitter circuit to said second output terminal without introduction of variations in amplitude or phase with frequency over said audio frequency range; and

means for transferring intensity modulated signals from said output of said transfer function circuit to said second output terminal without further introduction of variations in amplitude or phase with frequency over said audio frequency range to develop a second synthesized stereo sound signal.

4,394,536

SOUND REPRODUCTION DEVICE

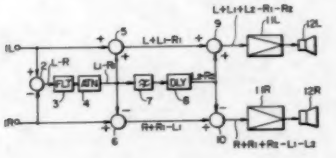
Kenji Shima, and Masahiro Hibino, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1981, Ser. No. 272,548

Claims priority, application Japan, Jun. 12, 1980, 55-80367

Int. Cl.³ H04R *5/00*

U.S. Cl. 179—1 G **8 Claims**



1. A sound reproducing device operatively connectable to first and second loudspeakers and to receive a stereo signal including left and right signals, comprising:

first main signal path circuit means for transmitting a first one of the left and right signals of the stereo signal to the first loudspeaker;

second main signal path circuit means for transmitting a second one of the right and left signals of the stereo signal to the second loudspeaker;

means for producing a difference signal equal to the difference between the right and left signals;

means for varying said difference signal to produce a varied difference signal;

first addition means for adding the varied difference signal to said first one of the left and right signals in said first main signal path circuit means;

second addition means for adding a signal whose phase is opposite to the phase of said varied by difference signal to said second one of the left and right signals in said second main signal path circuit means;

means for phase shifting said varied difference signal to produce a phase shifted varied difference signal;

third addition means for adding said phase shifted varied difference signal to said first one of the left and right signals in said first main signal path circuit means; and

fourth addition means for adding to said second one of the left and right signals in said second main signal path circuit means a signal whose phase is opposite to the phase of said phase shifted varied difference signal.

4,394,537

SOUND REPRODUCTION DEVICE

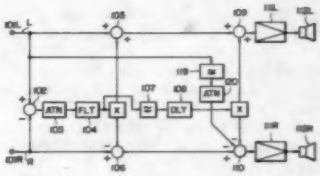
Kenji Shima, and Masahiro Hibino, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1981, Ser. No. 272,549

Claims priority, application Japan, Jun. 12, 1980, 55-80368

Int. Cl.³ H04H *5/00*

U.S. Cl. 179—1 G **7 Claims**



1. A sound reproducing device operatively connected to first and second loudspeakers and operatively connected to receive a stereo signal including left and right signals, comprising:

first main signal path circuit means for transmitting a first one of the left and right signals of the stereo signal to the first loudspeaker;

second main signal path circuit means for transmitting a second one of the right and left signals of the stereo signal to the second loudspeaker;

means for producing a difference signal equal to the difference between the right and left signals;

means for varying said difference signal to produce a varied difference signal;

first addition means for adding the varied difference signal to said first one of the left and right signals in said first main signal path circuit means;

second addition means for adding a signal whose phase is opposite to the phase of said varied difference signal to said second one of the left and right signals in said second main signal path circuit means;

means for phase shifting said varied difference signal to produce a phase shifted varied difference signal;

third addition means for adding said phase shifted varied difference signal to said first one of the left and right signals in said first main signal path circuit means;

fourth addition means for adding to the second one of the left and right signals in said second main signal path circuit means a signal whose phase is opposite to the phase of said phase shifted varied difference signal; and

means for converting one of the left and right signals from one of said first and second main signal path circuit means and applying the converted signal to the other of said first and second main signal path circuit means so as to substantially compensate the one of said left and right signals in

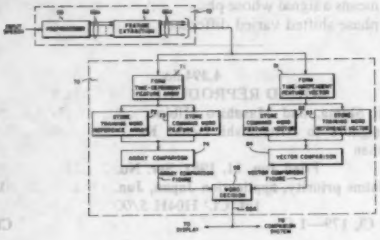
the other of said first and second main signal path circuit means.

4,394,538

SPEECH RECOGNITION SYSTEM AND METHOD

Ben Warren, Saratoga; George M. White, Los Altos; Rick Parfitt, Los Gatos, and Peter Deng, San Jose, all of Calif., assignors to Threshold Technology, Inc., Delran, N.J.

Filed Mar. 4, 1981, Ser. No. 240,273
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—1 SD **24 Claims**



1. Apparatus for receiving spoken input training words and for subsequently recognizing a spoken input command word, comprising:

feature extraction means for generating feature signals indicative of the presence or absence of features in a spoken input word;

means for storing, as a time-dependent reference array, the presence or absence status of feature signals during each training word;

means for storing, as a non-time-dependent reference vector, an indication of the cumulative presence of feature signals during each training word;

means for storing, as a time-dependent feature array, the status of feature signals during the command word;

means for storing, as a non-time-dependent feature vector, an indication of the cumulative presence of feature signals during the command word;

means for comparing member-by-member, the command word feature array with each training word reference array to obtain an array comparison figure for each training word;

means for comparing, feature-by-feature, the command word feature vector with each training word reference vector to obtain a vector comparison figure for each training word; and

means responsive to both the array comparison figure and the vector comparison figure for each training word for selecting the training word which most closely matches the command word.

4,394,539

TIMEPIECE WITH AUTOMATIC TIME SETTING SYSTEM THRU DIAL TELEPHONE LINE AND AUTOMATIC SPEED ADJUSTING SYSTEM

Tsan-chen Chu, 31-2, Alley 5, Lane 100, Tun Hua S. Rd., Taipei, Taiwan

Filed Mar. 24, 1981, Ser. No. 247,013
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 TC **4 Claims**

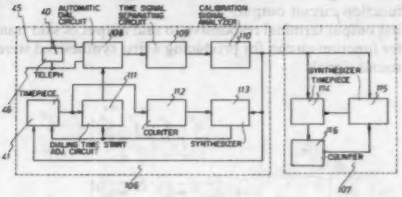
1. An automatic time-setting and adjusting system for a timepiece to be used in conjunction with a telephone standard time annunciation station which, when dialed, provides a voice signal announcing a approaching time and audible tone designating that time at the proper instant, said system comprising:

first means for dialing said standard time annunciation system at a prescribed time;

second means connected to said telephone line for separating voice signals from said audible tone;

third means for analyzing the received voice signal from the standard time annunciation station to determine the announced time;

fourth means for counting time synchronously with said timepiece and providing a time signal representing the time registered at said timepiece;



fifth means for determining the time difference between the determined announced time and the time represented by said time signal and providing a time differential signal corresponding to the determined time difference;

sixth means for adjusting the time and operating speed of said timepiece in accordance with said time differential signal; and

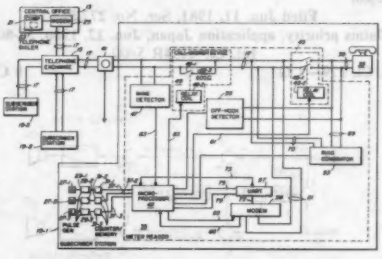
seventh means responsive to said time differential signal for determining said prescribed time.

4,394,540

REMOTE METER READER AND METHOD FOR READING METERS OVER NON-DEDICATED TELEPHONE LINES

Alan E. Willis; John R. Lowdenslager, both of Stamford, and Neal Goldstein, Middletown, all of Conn., assignors to Timex Corporation, Waterbury, Conn.

Filed May 18, 1981, Ser. No. 264,723
Int. Cl.³ H04M *11/08*
U.S. Cl. 179—2 AM **19 Claims**



1. A method of transmitting meter data to a central office from meters at a telephone subscriber station over non-dedicated telephone lines in response to a call initiated by said central office and without actuating the ringing device in the subscriber telephone at the telephone subscriber station, the method comprising:

a. providing at said subscriber station a selectively operable meter reader, said meter reader being coupled in series between said telephone line and said subscriber telephone, being connected to said meter, being capable of answering telephone calls and having clock means keeping time of day,

b. isolating said subscriber telephone from said telephone lines for a predetermined data access time,

c. answering any call received with said meter reader when said subscriber telephone is isolated,

d. confirming that the call received is the call initiated by the central office, and

e. transmitting meter data to said central office if it is confirmed that said call is from said central office.

4,394,541

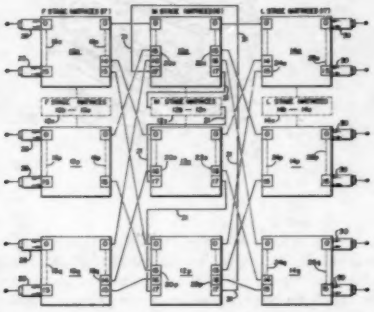
THREE STAGE MINIMUM CONFIGURATION CONDITIONALLY NON-BLOCKING MATRIX

Lewis J. Seiden, 37 Liberty Rd., Tappan, N.Y. 10983

Filed Jan. 2, 1981, Ser. No. 222,063

Int. Cl.³ H04G 3/42

U.S. Cl. 179—18 GE **17 Claims**



1. In a switching system having N inputs and M outputs, a three stage matrix array wherein each input may be connected to each output not busy, and every input may simultaneously reach an output, comprising

a first stage including n square substage matrices, each with x inputs and outputs, where N=nx

a second stage including x substage matrices, each with n inputs and m outputs, an output from each first substage matrix being connected to an input of each second substage matrix,

a third stage including m square matrices, each with x inputs and outputs where M=mx, an output from each second substage matrix being connected to an input of each third substage, and

switch means for interconnecting the combinations of inputs and outputs of each substage matrix.

4,394,542

TELEPHONE TRANSMISSION CIRCUIT

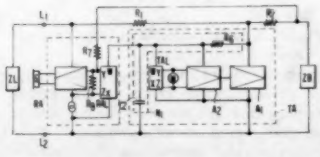
Michio Hara; Akinobu Tomimori, and Hiroshi Hara, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1981, Ser. No. 243,111

Claims priority, application Japan, Mar. 26, 1980, 55-38423

Int. Cl.³ H04M 1/60

U.S. Cl. 179—81 B **3 Claims**



1. A telephone transmission circuit for connection to a line having first and second line terminals, said telephone transmission circuit comprising: a microphone for providing voice frequency signals; a transmitter amplifier means for amplifying the voice frequency signals from said microphone; a receiver amplifier means for amplifying voice frequency signals received from said line; a serially connected circuit means connected between said first and second line terminals, said circuit means comprising a first resistance, a second resistance and a balancing network for preventing the output from said transmitter amplifier from entering said receiver amplifier; a smoothing circuit means for smoothing a voltage supplied from said line, said smoothing circuit comprising a third resistor having one end connected to the connection point of said first and second resistors and a first capacitor connected between said second line terminal and the other end of said third resistor; a first line equalization circuit connected in parallel with said first capacitor of said smoothing circuit for varying the input impedance of said transmitter amplifier in accordance with the charge voltage of said first capacitor; a second line equalization circuit connected in parallel with said first capacitor for varying the input impedance of said receiver amplifier in accordance with the charge voltage of said first capacitor; a constant current circuit; said transmitter amplifier and said receiver amplifier each having power source terminals supplied with DC current from said first and second line terminals, said power source terminals of said transmitter amplifier being connected between the connecting point of said first and second resistances and said second line terminal, said power source terminals of said receiver amplifier being connected in parallel with said serially connected circuit means via said constant current circuit, and the input signals of said receiver amplifier being supplied from the connecting point of said second resistance and said balancing network to input terminals of said receiver amplifier, which input terminals of said receiver amplifier are connected in parallel with said second line equalization circuit.

4,394,543

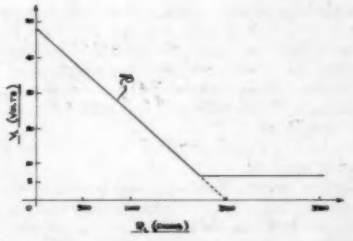
TELEPHONE LINE HOLDING CIRCUIT

Francis P. Keiper, Jr., Sunnyvale, and John N. Kerns, Redwood City, both of Calif., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Jun. 4, 1981, Ser. No. 270,507

Int. Cl.³ H04M 1/24

U.S. Cl. 179—84 R **15 Claims**



1. A holding circuit adapted for connection across a telephone line which has a voltage across the line and a current flowing through the line when held, said holding circuit being adapted to maintain the line on hold, said holding circuit comprising:

(a) current regulating means responsive to a current flow through a telephone line having a voltage across the line and a current flowing through the line for maintaining the line current at a predetermined current level when the voltage across the line is at least at a predetermined minimum voltage level;

and

(b) voltage regulating means reponsive to the voltage appearing across the line for preventing an average of the line voltage from being reduced below said predetermined

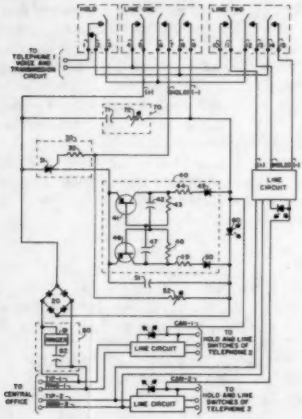
minimum voltage level, said voltage regulating means controlling said current regulating means in response to current flow through the telephone line and the difference between voltage across the telephone line and a reference voltage.

4,394,544

LINE CIRCUIT FOR MULTIPLE LINE TELEPHONE

Daniel De Leon, Santa Ana, Calif., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Nov. 9, 1981, Ser. No. 319,563
Int. Cl.³ H04M *1/72, 9/00*
U.S. Cl. 179—99 H **9 Claims**



1. A plurality of line circuits in a multiple line telephone having a line switch for each line, and a hold switch for all lines, each of said line circuits connected to a telephone switching system via an associated line, said telephone switching system operated to apply alternating current ringing signal and loop current to a selected one of said lines, each of said line circuits comprising:

a loop holding circuit connected to an associated line and said hold switch;

a switching circuit connected to said holding circuit; and

visual indicating means connected to said switching circuit;

one of said line switches for each line operated to connect said visual indicating means to said line;

whereby said loop current flows through said line switch and said visual indicating means;

said visual indicating means operated in response to said loop current to generate a steady visual signal;

said hold switch operated to generate a holding circuit enable signal and further generated to release said operated line switch;

said holding circuit operated in response to said enable signal to conduct said loop current to said switching circuit;

said switching circuit operated in response to said loop current to periodically, alternately apply and shunt, said loop current to and from said visual indicating means;

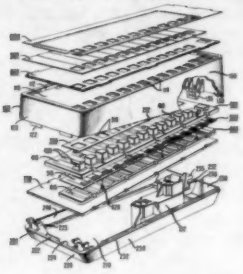
said visual indicating means operated in response to said periodically applied loop current to generate a periodic visual signal of a first characteristic.

4,394,545

CONSTRUCTION OF A TELEPHONE INSTRUMENT

Francis S. Doyle, Oaklandon; Terry B. Prince, and Martin J. Stevenson, both of Indianapolis, all of Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 11, 1980, Ser. No. 129,243
Int. Cl.³ H04M *1/02*
U.S. Cl. 179—179 **13 Claims**



1. A housing for a telephone instrument comprising first and second housing members that are joined together, the housing members having rims that are positioned adjacent to one another when the housing members are joined together, one portion of both the first and second housing members including cooperating elements for interlocking the first and second housing members together, and an opposing portion of both the first and second housing members including means for latching the first and second housing members together CHARACTERIZED IN THAT the means for latching the housing members together comprises an inflexible securing element included as part of the first housing member, the securing element being adjacent to a wall of and extending beyond the rim of the first housing member, and a cooperating inflexible securing element integral to and extending interiorly from a wall of the second housing member that is adjacent to the wall of the first housing member when the housing members are joined together, the wall of the second housing member being flexed from its normal position during the assembly of the housing members and returning to its normal position once assembly is complete to latch the housing members together, wherein the interlocking elements and the latching means alone join the housing members together.

4,394,546

COMPOSITE SWITCH ASSEMBLY

Masatoshi Harumatsu, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1981, Ser. No. 310,291
Claims priority, application Japan, Oct. 9, 1980, 55/144442[U]; Nov. 5, 1980, 55/158019[U]
Int. Cl.³ H01H *9/00*
U.S. Cl. 200—5 R **13 Claims**

1. A composite switch assembly comprising:

(a) a cylindrical rotary knob;

(b) four push buttons each being substantially quadrantal when viewed from above and arrayed circularly within said rotary knob in a manner to be movable upwards and downwards a predetermined amount;

(c) a switch base plate disposed underneath said rotary knob;

(d) partition means for partitioning said four push buttons, a lower part of said partition means being fixed to said switch base plate;

(e) co-acting means provided respectively on said push buttons and said partition means for holding said push buttons in place within said rotary knob; and

(f) means provided on said push buttons and said partition means for holding said rotary knob in place; and

(g) contact means including six contact mechanisms disposed on said switch base plate, four of said contact mechanisms each being located under a respective one of said push buttons and adapted to be actuated by depression of the respective one of said push buttons, and the remaining two of said contact mechanisms each being respectively actuated by turning said rotary knob.

4,394,547

LAMINATED MEMBRANE SWITCH

Willis A. Larson, Crystal Lake, Ill., assignor to Oak Industries, Inc., Rancho Bernardo, Calif.

Continuation of Ser. No. 118,410, Feb. 4, 1980, Pat. No. 4,314,114. This application Jan. 27, 1982, Ser. No. 343,310

The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.

Int. Cl.³ H01H *13/02*

U.S. Cl. 200—5 A **4 Claims**

1. A membrane switch assembly including a membrane, a substrate, a spacer member having spaced openings therein positioned between said membrane and substrate, and a thin layer of a polyethylene material interposed between said membrane and spacer and between said substrate and spacer, electrical conductors formed on each thin layer and facing the spacer, said membrane, substrate and spacer being formed of a material which is heat bondable to the interposed polyethylene material, the application of heat and pressure to said assembly utilizing said polyethylene material to bond said membrane, substrate and spacer into a switch assembly.

4,394,548

JOYSTICK SWITCH

Frank P. Dola, Port Richey, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 8, 1982, Ser. No. 355,818

Int. Cl.³ H01H *25/00, 3/02*

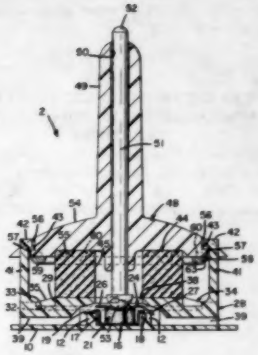
U.S. Cl. 200—6 A **15 Claims**

1. A joystick switch assembly which comprises:

an elongate handle;

a base member lying in a plane extending transversely of the axis of said handle, said base member having first contact means thereon;

a support member integral with said handle which supports said handle for arcuate movement, said support member moving relative to said base member, said support member having second contact means thereon arranged to contact said first contact means upon moving said handle in a predetermined direction;



a plurality of elongate latch arms integral with one of said members and extending between said base and said support member, said latch arms having distal ends with latches thereon which limit the relative movement of said support member away from said base member; said distal ends serving as pivot points for said arcuate movement of said support member; and

first resilient means between said support member and said base member, said first resilient means urging said support member away from said base member.

4,394,549

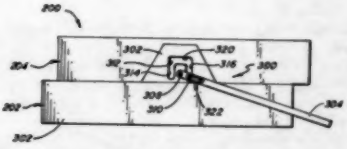
ELECTRICAL CONNECTOR

Richard D. Dennis, Bridgeport, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,122

Int. Cl.³ H01H *15/10*

U.S. Cl. 200—16 E **9 Claims**



1. An electrical connector comprising:

a first connector member defining a longitudinal axis;

a second connector member movable between a first position forming a first electrically conductive circuit with the first connector member, and a second position longitudinally spaced from the first position and forming a second electrically conductive circuit with the first connector member;

wherein a selected one of the first and second connector members includes a plurality of outwardly extending blades defining parallel blade axes, and the other one of the first and second connector members defines a plurality of receptacles receiving the blades and defining receptacle axes parallel to the blade axes;

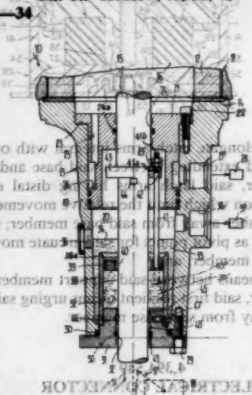
switching means including a plate secured to the first connector member, a handle, means connecting the handle to the plate for movement between first and second handle positions, and means connecting the second connector member to the handle for moving the second connector member along the blade axes away from the first position, then along the longitudinal axis of the first connector member, and then along the blade axes toward and into the second position and means for guiding movement of the second connector member between the first and second positions thereof.

4,394,550

GAS-BLAST SWITCH ACTUATABLE BY A MECHANICAL DRIVE BY MEANS OF A DRIVE ELEMENT

Hubert Wallimann, Oberentfelden, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed Jun. 5, 1981, Ser. No. 270,782
Claims priority, application Switzerland, Jul. 4, 1980, 5152/80
Int. Cl.³ H01H *7/03, 33/42*
U.S. Cl. 200—34 **7 Claims**



1. A gas-blast switch containing an operating mechanism including a damping device comprising a mechanical drive;
a drive element connected to said mechanical drive;
said gas-blast switch being actuatable by means of said mechanical drive and said drive element;
a switch housing;
a through-passage housing connected to said switch housing and containing a liquid bath;
said drive element being guided out of said switch housing through said through-passage housing and said liquid bath, with said liquid bath serving as a gas-tight seal for said drive element; and
a hydraulic damping device immersed in said liquid bath within said through-passage housing and cooperating with the drive element.

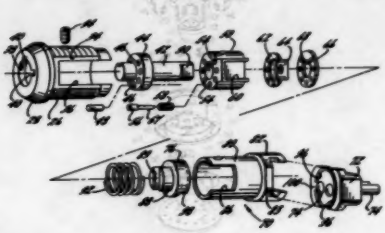
4,394,551

SWITCH LOCK

Frank J. S[illegible]rbing, River Grove, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Filed Apr. 24, 1981, Ser. No. 257,491
Int. Cl.³ H01H *9/28*
U.S. Cl. 200—44 **8 Claims**

1. In a lock having a cylinder and key actuated spindle means disposed in said cylinder, a switch operating subassembly adapted to be operated by rotation of the spindle means through use of a proper key, comprising, a first contact effecting member having means for removably coupling said first member stationarily to said cylinder, a second contact effecting member adapted to be coupled to said spindle means for rotation therewith, said first and second contact effecting members being interfitting and having mutually engaging stop means to limit rotation of said spindle means and said second contact effecting member by a predetermined arcuate amount, at least said first contact effecting member having electric switch contact elements associated therewith, said second contact effecting member having means for opening and closing a circuit with said electric switch contacting elements, spring means interposed between the lock spindle means and



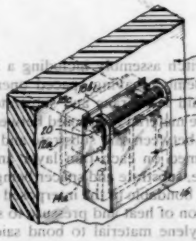
second contact effecting member urging and holding the latter in interfitting engagement with the first contact effecting member, said first contact effecting member including opening means at the rear so that a rod like tool inserted therein depresses the second contact effecting member releasing the interfitting engagement and said means for removably coupling the first contact effecting member to the cylinder including means for enabling sliding removal of the first contact effecting member upon release of the interfitting engagement with said second contact effecting member.

4,394,552

FLIP-ACTION GUARD AND POSITION INDICATOR FOR PUSH-TO-ACTUATE AND PUSH-TO-RELEASE SWITCH

Mark S. Schlosser, Seattle, Wash., assignor to Korry Manufacturing Co., Seattle, Wash.

Filed Nov. 27, 1981, Ser. No. 325,139
Int. Cl.³ H01H *13/04*
U.S. Cl. 200—61.62 **8 Claims**



1. A switch assembly including push-to-latch and push-to-release switch means adapted to be mounted in a mounting panel, said switch means including a push-button head manually accessible from the front of the mounting panel and guided for lineal reciprocation transversely to the panel through a range including an intermediate latched position and extending between an outer, released position of said assembly and an inner, latch-releasing position thereof, a flip cover, means for hingedly mounting said flip cover adjacent to said push-button head in fixed relation to the panel so as to swing about an axis transverse to such lineal reciprocation between an inner, limiting guard position overlying said head in its released position,

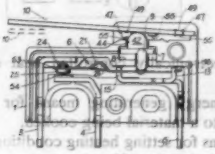
and a fully outwardly extending position clearing the push-button head for manual access to said head, mutually interengageable abutment elements respectively carried by said flip cover and said push-button head disengaged in the released position of the push-button head and relatively positioned, firstly, to pass one another without engaging one another accompanying swinging of said flip cover to said fully outwardly extending position with said head in its released position, secondly, to engage one another with the flip cover maintained thereby partially outwardly extended with the head in its latched position, and thirdly, to engage one another in sliding contact terminated by one such abutment element passing out of engagement with the other accompanying movement of the flip cover inwardly and conjoint movement of the push-button head inwardly beyond latched position of the head, thereby to permit return of the flip cover to its guard position as the push-button head approaches latch-releasing position.

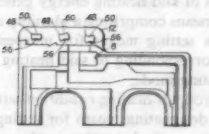
4,394,553

SNAP ACTION SWITCH

Paul G. Feil, Evansville, Ind., assignor to AMF Incorporated, White Plains, N.Y.

Filed Apr. 23, 1981, Ser. No. 256,280
Int. Cl.³ H01H 5/22
U.S. Cl. 200—67 DA **7 Claims**





2. A switch comprising:

a casing;

a first contact mounted within the interior space of the casing;

a unitary support means comprising a terminal portion without said casing, a base portion disposed longitudinally within the interior space of said switch, a first portion disposed normal to and at one end of said base portion and having a slot therein a second and a third portion spaced apart and normal to said base portion at the other end thereof with each said second and third portions having a slot therein;

a blade means mounted with spring tension to said support means and comprising a contact carrying end free to move within the interior space of said casing, two spaced apart formed spring tension arm portions interconnected at their respective ends by a first and a second transverse portion, a rigid tongue portion integral with said first transverse portion and disposed between said arm portions and terminating in a bearing edge, and a shank portion integral with said second transverse portion with two laterally extending trunnion portions at its other end;

said blade means being mountable to said support means with said bearing edge of said tongue being held in said slot of said first portion while said laterally extending portions of said shank portions are pivotally disposed within a respective slot of the second and third portions of said support means to thereby retain the blade means mounted with the spring tension of said arm portions; and

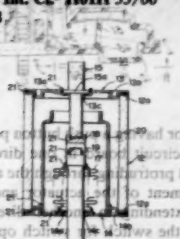
actuating means operatively associated with said blade means to actuate the free end thereof toward and away from said first contact to make and break contact therewith.

4,394,554

VACUUM CIRCUIT INTERRUPTER

Junichi Warabi, Shizuoka; Shinzo Sakuma, Yokohama; Hidemi Kawaguchi, and Yukio Kobari, both of Tokyo, all of Japan, assignors to Kaburshiki Kaisha Meidensha, Japan

Filed Apr. 27, 1981, Ser. No. 257,853
Claims priority, application Japan, May 6, 1980, 55-59675
Int. Cl.³ H01H 33/66
U.S. Cl. 200—144 B **33 Claims**



1. A vacuum interrupter for electric power having a vacuum vessel, the vacuum vessel comprising:

(a) a cylindrical insulating envelope made of a ceramic materials or crystallized glass having a metallized layer at each end thereof;

(b) a first metallic end plate made of copper located on one end of said cylindrical insulating envelope;

(c) a second metallic end plate made of copper located on the other end of said cylindrical insulating envelope;

(d) a stationary electrode holder fixedly extending through said first metallic end plate, at the inner end of which a stationary electrode contact is provided;

(e) a movable electrode holder extending through said second metallic end plate so as to be able to move in a given direction at the inner end of which a movable electrode contact is provided;

(f) an arc shielding member located within said cylindrical insulating envelope so as to surround said stationary and movable electrode contacts;

(g) a bellows located within said arc shielding member for movably sealing said movable electrode holder with said second metallic end plate; and

(h) means for connecting said first metallic end plate with one metallized layer of said cylindrical insulating envelope, connecting said second metallic end plate with the other metallized layer of said cylindrical insulating envelope, connecting said first metallic end plate with said stationary electrode holder, and connecting one end each of said arc shielding member and bellows with said second metallic end plate.

4,394,555

SWITCH ASSEMBLY WITH PIVOTED ACTUATOR

Donald A. Long, and Thomas R. Sowash, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 8, 1981, Ser. No. 271,690
Int. Cl.³ H01H 13/52
U.S. Cl. 200—159 R **4 Claims**

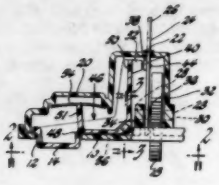
1. A switch assembly comprising

a support having a face, an aperture defined in the face,

a circuit board mounted on the support, the board surface extending transverse to the said face,

a switch including a movable contact and a stationary contact mounted on the circuit board and arranged for operation between open and closed state by movement of the movable contact generally perpendicular to the circuit board, and

a switch actuator having pivot means mounted on the support adjacent the aperture for rocking movement about an axis substantially parallel to the circuit board and the face,



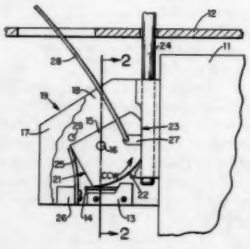
the actuator having a push button portion extending away from the circuit board in one direction from the pivot means and protruding through the aperture to allow manual movement of the actuator and having an operator portion extending in another direction from the pivot means to the switch for switch operation upon actuator movement, whereby a force applied to the push button portion in a direction generally perpendicular to the face is effective to operate the switch.

4,394,556

CAM OPERATED SWITCH ASSEMBLY

Gilbert Gould, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 26, 1982, Ser. No. 352,822
Int. Cl.³ H01H *17/16*
U.S. Cl. 200—161 **9 Claims**



1. A switching system for connecting battery power to an electronic unit comprising,

a normally-closed switch having an operable lever arm,

a rotatable cam having a curved surface for depressing said lever arm to open said switch,

a lanyard,

means in said cam for releasably attaching one end of said lanyard thereto, and

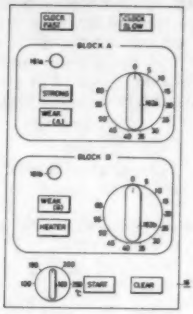
means engageable with said cam for preventing rotation of said cam.

4,394,557

ELECTRONIC CONTROLLED HEAT COOKING APPARATUS

Jin Tachihara, Oumihachiman, and Hideaki Koyama, Otsu, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed May 20, 1980, Ser. No. 151,609
Claims priority, application Japan, Jun. 13, 1979, 54-75024; Jun. 13, 1979, 54-75026
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—10.55 B **13 Claims**



1. An electronically controlled heat cooking apparatus, comprising:

heating energy generating means for providing heating energy to a material being cooked,

entry means for setting heating conditions corresponding to a desired plurality of heating modes successively set in an arbitrary sequence for cooking said material being cooked by means of said heating energy generating means;

said entry means comprising a plurality of groups of heating condition setting means for independently establishing signals corresponding to said heating conditions of a desired heating mode;

each said group of heating condition setting means comprising heat designating means for setting the heat to be applied during a single heating mode, and timer time period entry means for setting a timer time period corresponding to the desired duration of said single heating mode;

storing means for storing signals corresponding to said heating conditions set by said plurality of groups of heating condition setting means and to the sequence in which said groups were successively set,

said storing means comprising heat storing means for storing the heat settings entered by said heat designating means, timer time period storing means for storing said timer time periods entered by said timer time period entry means, and sequence storing means, responsive to the sequence in which an operator sets said groups, for identifying the sequence in which said groups have been set regardless of which group said operator chooses to set first;

heat start commanding means,

control means responsive to the output of said heating start commanding means and to said signals stored in said storing means for controlling said heating energy generating means to perform said desired sequential heating modes in accordance with the order stored in said order storing means and the heating conditions stored in said heat storing means and said timer time period storing means, and

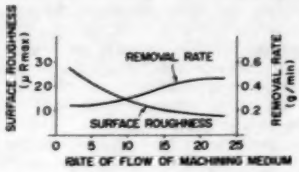
said cooking apparatus further comprising an operation portion having a plurality of discrete sections, each of said sections having a respective group of heating condition setting means disposed therein.

4,394,558

EDM METHOD OF MACHINING WORKPIECES WITH A CONTROLLED CRATER CONFIGURATION

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Apr. 13, 1981, Ser. No. 253,287
Claims priority, application Japan, Apr. 15, 1980, 55-49662; Apr. 15, 1980, 55-49663
Int. Cl.³ B23P 1/12
U.S. Cl. 219—69 W 8 Claims



1. A method of machining an electrically conductive workpiece with a tool electrode juxtaposed therewith across a machining gap flooded with a liquid machining medium,

wherein a succession of time-spaced electrical pulses are passed through said gap to produce between the opposed surfaces of the tool electrode and the workpiece discrete electroerosive discharges each of which results in the formation of a discharge crater on a localized spot on the workpiece surface and the consequential localized stock removal therefrom and which, with such discharge craters formed successively and randomly throughout the workpiece surface opposed to the tool electrode surface, cumulatively remove stock from the workpiece while the tool electrode is moved relative to the workpiece along a predetermined path to advance stock removal in the workpiece;

wherein the liquid machining medium may be forced to flow through said machining gap; and

wherein the tool electrode may be displaced relative to the workpiece, independently of but simultaneously with the aforesaid relative displacement therebetween,

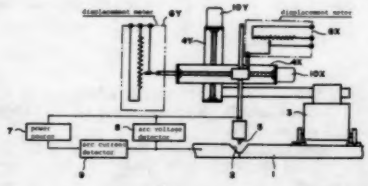
said method comprising: reducing the surface roughness of said machined workpiece by increasing at least one of the rate of said flow of the liquid machining medium through said gap and the rate of the second-mentioned relative displacement between the tool electrode and the workpiece to such an extent that each of said discharge craters becomes elliptical in shape and has its major axis at least two times greater than its minor axis.

4,394,559

ARC WELDING METHOD

Hirokazu Nomura; Yuji Sugitani, both of Tsu, and Yasuo Suzuki, Hisai, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Toyko, Japan

Filed Dec. 22, 1981, Ser. No. 333,403
Claims priority, application Japan, Dec. 27, 1980, 55-188685
Int. Cl.³ B23K 9/12
U.S. Cl. 219—125.12 5 Claims



1. In an arc welding method of the type in which while oscillating a welding electrode in a width direction within a groove of a pair of metals to be welded, the vertical movement of said electrode is controlled so as to always maintain an arc length constant, the improvement comprising the steps of: arc welding said groove of a predetermined shape by using a predetermined welding speed and wire feed speed; upon completion of a half cycle of oscillation of said electrode, integrating a vertical displacement of said electrode over a period of time to obtain a cross-sectional area S_o described by said electrode and also obtaining an oscillation stroke x_o of said electrode; storing said cross-sectional area S and said oscillation stroke in memory means; similarly obtaining a cross-sectional area S and an oscillation stroke x for the next half cycle of oscillation of said electrode; and varying a cross-sectional area of metal deposition by an amount ΔS given by

$$\Delta S = S - \frac{x}{x_o} S_o$$

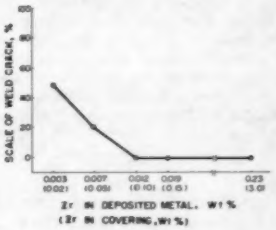
whereby providing a weld bead having a uniform level.

4,394,560

COVERED ELECTRODE CONTAINING ZIRCONIUM FOR SHIELDED METAL ARC WELDING

Katsuhiro Kishida; Yutaka Mekuchi, both of Yokohama; Sumio Hirao, Kaminagaya, and Hirohiko Date, Yokosuka, all of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Oct. 9, 1981, Ser. No. 310,283
Claims priority, application Japan, Oct. 9, 1980, 55-140555
Int. Cl.³ B23K 35/30
U.S. Cl. 219—137 WM 9 Claims



1. A covered electrode for shielded metal arc welding, the electrode consisting of a core wire and a covering and comprising such amounts of Ni, Si, B, Nb, C and Zr as essential alloying elements that deposited metal given by the covered electrode contains at least 40% by weight of Ni, 3 to 8% by weight of Si, 0.1 to 0.5% by weight of B, 0.3 to 2.0% by weight of Nb, 0.2 to 1.5% by weight of C and 0.01 to 0.20% by weight of Zr.

4,394,561

TANK STRUCTURE FOR AN AIR HUMIDIFYING ELECTRODE STEAM GENERATOR

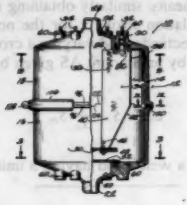
Allen J. Zerbel, Madison, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Apr. 6, 1981, Ser. No. 251,360
Int. Cl.³ H05B 3/60; F22B 1/30; B65D 6/00
U.S. Cl. 219—285 4 Claims

1. A generally cylindrical water tank for an electrical steam generator of an air humidifier including a plurality of electrodes mounted inside the tank in circumferentially-spaced relationship with each connected to a separate electrical terminal, said tank comprising:

mating top and bottom cylinder halves molded from an electrically insulative plastic material as substantially

mirror images of each other, each of said halves having an open mating end and a substantially closed, opposite end including an opening and a plurality of circumferentially-spaced, externally and internally projecting bosses at locations corresponding to desired locations of the electrical terminals, the terminal bosses on said top and bottom halves being substantially identical except at least some of said top half includes an electrical terminal integrally molded therein, each of said halves further including a radially extending row of at least two internally projecting mounting bosses radially aligned with and radially spaced from each of said terminal bosses, each of said mounting bosses adapted to receive means for anchoring the upper end of an electrode on said top half with one mounting boss in each row being circumferentially aligned with a corresponding boss in another row; and



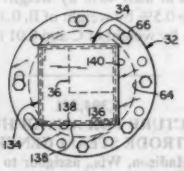
means for removably holding said mating ends of said top and bottom halves in assembly to define a chamber with the opening in said bottom half serving as a water inlet and the opening in said top half serving as a steam outlet.

4,394,562

ELECTRIC IMMERSION HEATER MOUNTING FLANGE

Fred Epstein, Clayton, and Tom Holden, Mehlville, both of Mo., assignors to Industrial Engineering and Equipment Incorporated, St. Louis, Mo.

Filed Jun. 11, 1981, Ser. No. 272,565
Int. Cl.³ H05B *3/82*; F24H *1/10*
U.S. Cl. 219—306 **6 Claims**



1. An immersion heater and tank assembly comprising:

(a) a tank including an open end having an annular flange, said flange having a plurality of circular mounting apertures disposed on a common pitch circle diameter at angular intervals equal to three hundred and sixty degrees (360°) divided by the number of apertures in the tank flange,

(b) an immersion heater receivable within the tank and having an annular mounting flange, said flange having mounting apertures disposed on a pitch circle diameter corresponding to the tank pitch circle diameter at center points including:

1. a reference center point,

2. a plurality of center points disposed at angular intervals from the reference center point equal to three hundred and sixty degrees (360°) divided by the number of apertures in the tank flange to define a first set of center points,

3. a plurality of center points disposed at angular intervals from the reference center point equal to three hundred and sixty degrees (360°) divided by the number of apertures in the tank flange plus one, to define a second set of center points, and

4. at least the first center point of the first set of center points on each side of the reference center point and the first center point of the second set of center points on each side of the reference center point cooperate to define elongate apertures, and

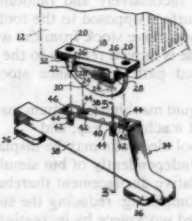
(c) fastener means receivable by the mounting apertures of the tank flange and the heater flange to connect the heater to the tank.

4,394,563

FOOT CONSTRUCTION FOR PORTABLE ELECTRIC SPACE HEATERS

John W. Schnell, Boone County, Mo., assignor to Toastmaster, Inc., Columbia, Mo.

Filed Jun. 8, 1981, Ser. No. 271,513
Int. Cl.³ F16M *11/20*; F24H *9/06*; H05B *1/00*
U.S. Cl. 219—342 **2 Claims**



2. In a portable electric space heater having a heater body, the combination of:

a pair of foot members adapted to support the heater body on a support surface, said foot members being initially detached from the heater body;

means for attaching said foot members to the heater body at spaced apart locations thereon to permit the foot members to support the heater body on a support surface;

a pair of rib members projecting pgenerally downwardly from the heater body at spaced apart locations thereon, each rib member having a curved edge operable to upset the heater body when placed on a support surface while detached from said foot members;

means for deactivating the heater when the heater body is upset; and

means presenting a socket in each foot member at a location to receive the corresponding rib when the foot member is attached to the heater body.

4,394,564

SOLID PLATE HEATING UNIT

Raymond L. Dills, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

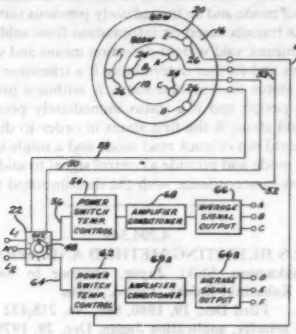
Filed Dec. 21, 1981, Ser. No. 332,587
Int. Cl.³ H05B *3/68*
U.S. Cl. 219—449 **8 Claims**

1. A plate surface heating unit having a top plate defining a heating area, said top plate having a softening temperature,

temperature setting means for determining the operating temperature of said top plate including a control system for maintaining said heating area substantially at the selected cooking temperature while maintaining the temperature of said heating area below the softening temperature of said top plate comprising:

a metal sheathed electrical resistance heating element in intimate contact with the underside of said top plate, said element having a heating capacity capable of elevating the temperature of said top plate above its softening temperature;

a temperature-sensing means arranged for sensing the temperature of said top plate at a plurality of selected locations in said heating area;



cycling means in said temperature setting means operable to control energization of said heating element to maintain the temperature of said top plate at said operating temperature;

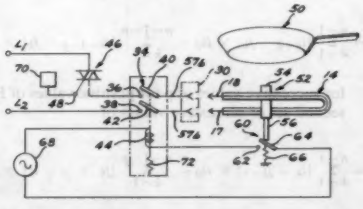
a control means in circuit connection between said temperature sensing means and said temperature setting means for deenergizing said heating element independent of said cycling means when the temperature sensed by said temperature sensing means of said top plate and said heating element at said selected locations of said heating area reaches a selected temperature below the softening temperature of said top plate.

4,394,565

POWER DISCONNECT ASSEMBLY FOR ELECTRIC HEATING ELEMENTS

Raymond L. Dills, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 23, 1981, Ser. No. 324,306
Int. Cl.³ H05B *3/68*
U.S. Cl. 219—452 **9 Claims**



1. A power disconnect assembly comprising;

a plug-in electric heating element adapted to support and heat a cooking vessel and its contents,

a terminal block with terminals for receiving the plug-in heating element and supplying electric power thereto,

a double pole switch with contacts connected to line voltage and to the terminal block,

a solenoid to open and close the switch,

means to detect the presence and absence of a cooking vessel on the heating element, and

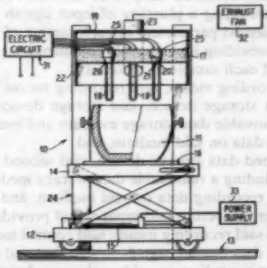
means cooperating with the cooking vessel detection means to de-energize the solenoid in the event of cooking vessel absence and open the double pole switch and energize the solenoid in the event the cooking vessel is present and close the double pole switch.

4,394,566

LADLE PREHEATER

Klas B. O. Magnusson, Hallstahammar, Sweden, assignor to Bulten-Kanthal Aktiebolag, Hallstahammar, Sweden

Continuation-in-part of Ser. No. 97,673, Nov. 27, 1979. This application Oct. 29, 1981, Ser. No. 316,128
Int. Cl.³ H05B *3/06*; F27B *14/00*
U.S. Cl. 219—523 **3 Claims**



1. A preheater for a casting ladle, comprising

(a) a lifting table having an upper surface adapted to support the ladle, and an actuator for adjusting the vertical position of said upper surface;

(b) a fixed frame disposed adjacent to said table;

(c) a horizontal refractory deck fixedly secured to said fixed frame in overhanging relation to said upper surface of said lifting table;

(d) a set of U-shaped electrical heating elements composed essentially of molybdenum disilicide, each of said heating elements being supported on said deck individually, and each having a vertical heating portion extending downwardly from said deck, and a pair of terminal portions extending upwardly from said deck;

(e) a set of refractory plugs for said set of heating elements, each said plug supporting one of said elements with said portions thereof projecting therefrom, each of said plugs being disposed in a vertical aperture in said deck, and being insertable and removable from above said deck;

(f) at least one of said plugs having a downwardly facing peripheral shoulder supported on an upwardly facing shoulder within the corresponding deck aperture;

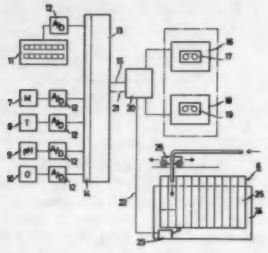
(g) an electrical circuit connected to said terminal portions; and

(h) a power supply connected to said actuator; whereby the ladle, supported on said upper surface beneath said deck may be raised to receive the vertical heating portions of said set of heating elements and be internally heated thereby.

4,394,567
DATA RECORDING SYSTEM

Max J. Schönhuber, Seefeldquai 1, CH 8008 Zürich, Switzerland

Filed Mar. 4, 1980, Ser. No. 127,117
Claims priority, application Switzerland, Mar. 6, 1979, 2150/79
Int. Cl.³ G01F 1/00; G06K 5/00
U.S. Cl. 235—375 13 Claims



1. Apparatus for recording data commensurate with a plurality of serially collected samples of material comprising:

means providing a plurality of input signals commensurate with sensed parameters of each sample of material;

means providing input signals commensurate with the identity of each sample of material;

data recording means, said recording means including:

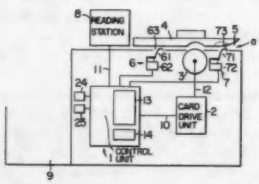
a first storage device, said storage device comprising a removable data storage medium and means for recording data on said medium; and

a second data storage device, said second storage device including a removable data storage medium and means for recording data on said medium; and control means interconnecting said input signal providing means and said recording means, said control means selectively delivering data bearing signals to said first and second storage devices for recording on said mediums whereby information commensurate with sensed material parameters and the identity of the sample corresponding to those sensed parameters will be selectively stored on the first or second or both said first and second storage mediums.

4,394,568
CARD READING APPARATUS

Yoshinobu Nakatsu, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 18, 1981, Ser. No. 294,054
Claims priority, application Japan, Sep. 5, 1980, 55/122406
Int. Cl.³ G06K 13/00; B65H 1/10
U.S. Cl. 235—475 4 Claims



1. A card reading apparatus for reading information recorded on a card, comprising:

(a) a hopper in which cards are accommodated or inserted,

(b) a card weight disposed on said hopper or the cards stacked in said hopper,

(c) a feed roller for feeding the cards stacked or inserted in said hopper,

(d) roller drive means for driving said feed roller,

(e) read means for reading information on the cards fed from said hopper,

(f) card detection means for detecting the presence or absence of the card in said hopper,

(g) weight detection means for detecting the presence or absence of the card weight in said hopper,

(h) mode selection means for selecting a sequential read mode or a single card read mode for a card read mode of said read means,

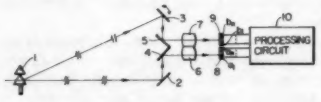
(i) memory means for storing detection signals of said card detection means and said weight detection means as status signals, and

(j) processing means for determining a mode setting signal from said mode selection means and determining transition of mode and an immediately previous status when the status transits based on information from said card detection means, said weight detection means and said memory means and further determining if a transition time from a first status to a second status is within a predetermined time period and if a status immediately previous to the second status is the first status in order to discriminate a one card out of stack read mode and a single inserted card read mode and provide a control signal to said roller drive means in accordance with the discriminated mode.

4,394,569
FOCUS DETECTING METHOD AND APPARATUS

Kazuo Nakamura, Shiki, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1980, Ser. No. 218,132
Claims priority, application Japan, Dec. 29, 1979, 54-172963
Int. Cl.³ G01J 1/36
U.S. Cl. 250—204 6 Claims



1. An automatic focusing device for a camera comprising:

first and second sensor groups;

means for projecting images of an object transmitted through a focusing lens onto said first and second sensor groups;

means for shifting at least one of said images on said sensor groups;

means for converting outputs of said first and second sensor groups to digital numbers;

means for storing said digital numbers;

calculating means for determining in succession:

(1) a first set of successive values of:

$$F = \sum_{k=1}^{n-1} |i_{k+1} - j_k| \times \beta_0 - \sum_{k=1}^{n-1-p} |i_{k-1-p} - j_k| \times \beta_{p+2}$$

for successive values of p for positive values of F, and a second set of successive values of:

$$F = \sum_{k=1}^{n-1} |i_k - j_{k+1}| \times \beta_0 - \sum_{k=1}^{n-1-p} |j_{k-1-p} - i_k| \times \beta_{p+2}$$

for successive values of p for negative values of F where i_k are ones of said digital numbers corresponding to sensors of said first sensor group, j_k are ones of said digital numbers corresponding to sensors of said second sensor group with k indicating sensor positions within

said sensor groups, n is the number of sensors in each said sensor group, $p=-1, 0, 1, 2, \ldots P$ with P being an integer less than n, $\beta_0=A_0/(n-1)$, $\beta_{p+2}=A_0/(n-p-1)$ and A_0 is a predetermined constant;

(2) values of $F=F_S$ and $F=F_{S+1}$ where F_S represents the value of F before a change in the sign of F and F_{S+1} represents the value of F after a change in the sign of F for successive values of p, and S corresponds to an image movement amount from a prior position to a position corresponding to the value of p before said change in sign of F; and

(3) a value of $M=S+F_S/(F_S-F_{S+1})$ if said change in the sign of said value F occurs during said first set of values and $M=S-F_S/(F_S-F_{S+1})$ if said change in the sign of said value F occurs during said second set of values;

and means for moving said lens directly from said prior position to a focused position determined in accordance with said value of M.

4,394,570

PHOTOELECTRIC CONVERSION CIRCUIT

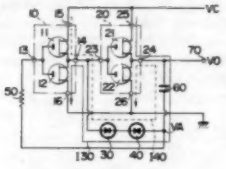
Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Dec. 5, 1980, Ser. No. 213,612

Claims priority, application Japan, Dec. 25, 1979, 54/168718

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—209 **5 Claims**



1. A photoelectric conversion circuit comprising:

a pair of series connected photodiodes having first and second connection points;

a capacitor having one side thereof connected to said first connection point of said photodiodes and arranged to be charged and discharged in response to a photocurrent from said photodiodes;

first and second semiconductor switching circuits, wherein the output of said first switching circuit is connected to the input of said second switching circuit to form a junction, and wherein said second connection point of said photodiodes is connected to said junction; and

the combination of said photodiodes and said capacitor forming a feedback circuit connected across said first and second switching circuit, whereby the switching operation of said switching circuits is effected in response to charging and discharging of said capacitor by photocurrent from said photodiodes.

4,394,571

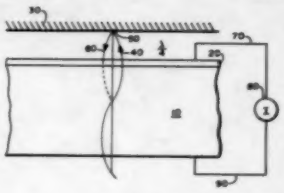
OPTICALLY ENHANCED SCHOTTKY BARRIER IR DETECTOR

Jaan Jurisson, Fridley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 18, 1981, Ser. No. 263,966

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—216 **4 Claims**



1. In a Schottky barrier radiation detector the improvement comprising:

a mirror positioned a distance from the barrier substantially equal to one quarter of the wavelength of the radiation being detected.

4,394,572

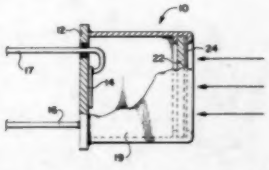
PHOTODETECTOR HAVING AN ELECTRICALLY CONDUCTIVE, SELECTIVELY TRANSMISSIVE WINDOW

Scott A. Wilber, Boulder, Colo., assignor to Biox Technology, Inc., Boulder, Colo.

Filed Apr. 1, 1981, Ser. No. 250,955

Int. Cl.³ H01J *5/02*

U.S. Cl. 250—239 **12 Claims**



1. A photodetector device having substantially decreased sensitivity to various electromagnetic interferences, the device comprising:

an electrically conductive case having a hollow interior portion;

a photosensitive material positioned within the case;

an opening defined in a portion of the case; and

an electrically conductive window structure transparent to selected wavelengths of energy positioned within the opening to enclose the interior of the case, the electrically conductive window being in electrical contact with the electrically conductive case;

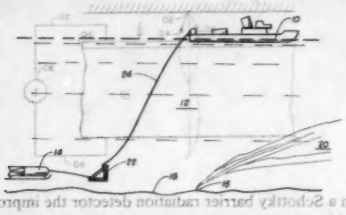
whereby the window may pass radiation of selected wavelengths while isolating the photosensitive material from interference energy of non-selected wavelengths.

4,394,573

METHOD AND APPARATUS FOR UNDERWATER DETECTION OF HYDROCARBONS

Aderbal C. Correa, John S. Gergely, both of Ponca City, Okla., and Andrew J. Blanchard, College Station, Tex., assignors to Conoco Inc., Ponca City, Okla.

Filed Dec. 15, 1980, Ser. No. 216,137
Int. Cl.³ G01V 5/00; G01T 1/167
U.S. Cl. 250—253 23 Claims



1. A method for detecting presence of hydrocarbons within a body of water proximate the water bottom comprising:

moving an instrument platform through said body of water at a pre-selected distance above the water bottom;

generating light energy and directing said light energy from said instrument platform toward a selected area within the body of water as a repetitive scanning beam on said water bottom transverse to the line of movement of said instrument platform;

detecting selected fluorescence excitation resulting from said light energy; and

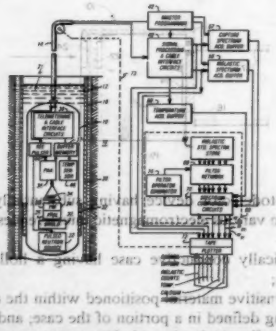
providing a data readout of said fluorescence excitations as an indication of hydrocarbon presence.

4,394,574

METHODS AND APPARATUS FOR CONSTITUENT ANALYSIS OF EARTH FORMATIONS

James A. Grau, Ridgefield, Conn., and Russel C. Hertzog, Missouri City, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 65,244, Aug. 9, 1979, abandoned. This application Sep. 15, 1980, Ser. No. 187,123
Int. Cl.³ G01V 5/00
U.S. Cl. 250—262 22 Claims



1. A method for investigating a geological system, which includes a geological formation traversed by a well bore, through comparison of a measured spectrum, generated by means including a radiation detector, with standard spectra having a given resolution, said method comprising the steps of:

(a) modifying said standard spectra to reduce the effect of the difference between the detector resolution extant during the detection of said measured spectrum and the given resolution of said standard spectra, to generate modified standard spectra; and

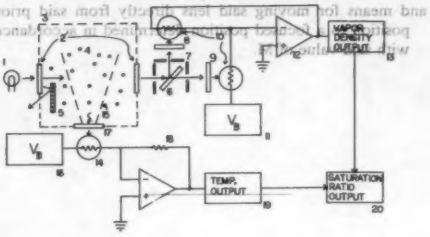
(b) comparing said modified standard spectra and said measured spectrum to derive information relative to the earth formation.

4,394,575

APPARATUS FOR MEASURING VAPOR DENSITY, GAS TEMPERATURE, AND SATURATION RATIO

Loren D. Nelson, Morrison, Colo., assignor to Ophir Corporation, Denver, Colo.

Filed Jun. 30, 1980, Ser. No. 164,059
Int. Cl.³ G01J 1/00
U.S. Cl. 250—343 6 Claims



1. A new and improved passive radiometric device for measuring true air temperature without physical contact wherein the improvement comprises:

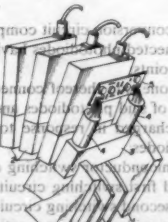
an extremely narrow system wavelength received radiance bandpass on the order of 0.5 microns or less, said received radiance bandpass being selected to be in the strong carbon dioxide absorption band whose center is at substantially 4.255 microns.

4,394,576

APPARATUS FOR DETECTING THE LOCATION OF INCIDENT RADIATION

Eiichi Tanaka, Mitaka; Norimasa Nohara; Hideo Murayama, both of Chiba; Kenji Ishimatsu, Abiko; Akira Ogushi, Mito, and Katsumi Takami, Tokyo, all of Japan, assignors to National Institute of Radiological Sciences, Chiba and Hitachi Medical Corporation, Tokyo, both of, Japan

Filed Sep. 29, 1980, Ser. No. 191,870
Claims priority, application Japan, Sep. 29, 1979, 54-124742
Int. Cl.³ G01T 1/20
U.S. Cl. 250—366 21 Claims



1. An apparatus for detecting a location of incident radiation, comprising:

a scintillation crystal;

a pair of photo-multiplier tubes having their photo-cathodes optically coupled to said scintillation crystal,

said scintillation crystal and said pair of photo-multiplier tubes forming a set;

a location detecting means coupled to said photo-multiplier tubes for specifying, from outputs of said photo-multiplier tubes, a location witin said crystal at which a scintillation has taken place,

said scintillation crystal being comprised of at least three adjacent crystal segments arranged in a row in a first direction with two end segments being located at the respective ends of the row, each of said crystal segments being so coupled to each other to insure that a scintillation occurring in any one of the component crystal segments will cause said photo-multiplier tubes to deliver substantially the same output irrespective of the location of occurrence of scintillation in said any one crystal segment and that scintillations occurring in the respective crystal segments will cause the photo-multiplier tubes to deliver outputs different in level with each other; and

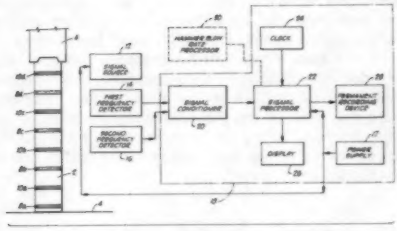
in which the photo-cathodes of said pair of photo-multiplier tubes face in a second direction transverse to said first direction.

4,394,577

DISPLACEMENT MEASUREMENT DEVICE AND METHOD

Marvin L. Peterson; Norman W. Hein, Jr., and Donald H. Oertle, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jun. 25, 1981, Ser. No. 277,441
Int. Cl.³ G01J 1/42
U.S. Cl. 250—372 **16 Claims**



15. A method of monitoring the displacement of an object, comprising:

marking the object with a first reflective material responsive to ultraviolet energy;

marking the object, in predetermined spaced relation with the first reflective material, with a second reflective material responsive to ultraviolet energy;

detecting when the first reflective material initially responds to ultraviolet energy;

detecting when the second reflective material initially responds to ultraviolet energy;

preventing the redetection of a response to the ultraviolet energy by the first reflective material after the initial response thereby to ultraviolet energy until after the step of detecting when the second reflective material initially responds to ultraviolet energy; and

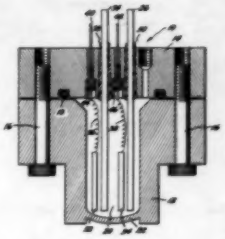
calculating, in response to said steps of detecting when the first reflective material initially responds and of detecting when the second reflective material initially responds, the distance the object has moved.

4,394,578

HIGH PRESSURE, HIGH RESOLUTION XENON X-RAY DETECTOR ARRAY

John M. Houston, Schenectady, and Nathan R. Whetten, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 24, 1981, Ser. No. 257,026
Int. Cl.³ G01T 1/18
U.S. Cl. 250—374 **9 Claims**



1. A high resolution detector array for computerized tomography comprising:

a sealed housing forming a detection chamber having an x-ray permeable window therein;

a collector plate extending through one wall of said housing into said chamber;

a voltage plate disposed in said chamber parallel to said collector plate; and

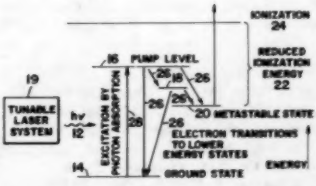
a volume of xenon gas disposed in said chamber at a density of approximately 0.5 to 2.5 grams per cubic centimeter.

4,394,579

LASER INDUCED PLASMA PRODUCTION FOR ISOTOPE SEPARATION

Fred R. Schwirzke, 1591 Josselyn Canyon Rd., Monterey, Calif. 93940

Filed Oct. 22, 1979, Ser. No. 86,982
Int. Cl.³ B01D 59/00
U.S. Cl. 250—423 P **17 Claims**



1. The method of separating selected atoms which absorb radiation of one frequency from other atoms which absorb radiation of different frequencies comprising:

(a) heating a mass of material containing both types of said atoms until a vapor of said material is formed;

(b) irradiating said vapor with a laser source operating at said one frequency whereby said selected atoms are pumped into excited metastable states above the ground state of said selected atoms;

(c) supplying a continuous source of thermal energy to said selected atoms in said excited metastable states forming an ionized plasma of said selected atoms; and

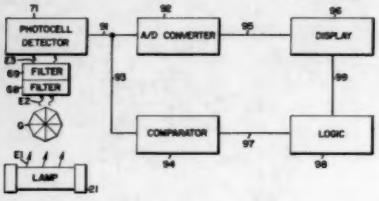
(d) separating said ionized plasma from all said other atoms.

4,394,580

METHOD AND APPARATUS FOR ANALYZING GEMS

Peter J. Gielisse, Brewster, Minn., assignor to L.C.E. Ltd., Worthington, Minn.

Filed Jul. 27, 1981, Ser. No. 287,165
Int. Cl.³ G01N 21/64
U.S. Cl. 250—461.1 46 Claims



1. Apparatus for analyzing gem specimens, comprising:

housing means;

a source of radiated energy carried by the housing means capable of emitting electromagnetic radiation over a wide spectrum of wavelengths of varying intensity;

holder means for supporting a gem specimen in a predetermined position relative to the source of radiated energy, the holder means being opaque to said radiated energy and having an aperture formed therethrough in which the gem specimen is disposed, and through which at least part of the gem specimen is exposed to said radiated energy;

the holder means and the source of radiated energy being constructed and arranged so that the radiated energy interacts with said gem specimen, causing it as a result to emit radiated energy over a wide spectrum of wavelengths of varying intensity;

detector means carried by the housing means in a position in which it is exposed to the energy emitted by said gem specimen and constructed to detect the intensity of energy emitted by said gem specimen over a spectrum of wavelengths that is narrow relative to the spectrum of wavelengths emitted by said gem specimen, said narrow spectrum being chosen as a function of known response of a particular species of gem to radiated energy;

signal means associated with the detector means for generating an electric signal representative of the intensity of energy emitted by the gem specimen and detected by the detector means;

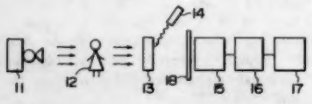
and readout means associated with the signal means for providing a readout in response to said electric signal that is representative of the nature of the gem specimen.

4,394,581

RADIATION IMAGE STORAGE PANEL

Kenji Takahashi; Hisashi Yamazaki; Junji Miyahara, all of Minamiashigara; Noboru Kotera; Shusaku Eguchi, both of Odawara, and Norio Miura, Isehara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 5, 1980, Ser. No. 156,520
Claims priority, application Japan, Jun. 7, 1979, 54/71604
Int. Cl.³ H05B 33/00
U.S. Cl. 250—484.1 13 Claims



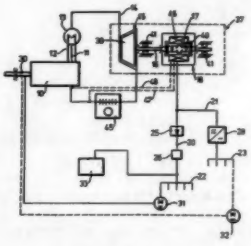
1. A radiation image storage panel having a fluorescent layer comprising a binder and a stimulable phosphor dispersed therein characterized in that said panel is colored with a colorant so that the mean reflectance of said panel in the wavelength region of the stimulating rays for said stimulable phosphor is lower than the mean reflectance of said panel in the wavelength region of the light emitted by said stimulable phosphor upon stimulation thereof.

4,394,582

METHOD AND APPARATUS FOR UTILIZING THE WASTE HEAT ENERGY OF AN INTERNAL COMBUSTION ENGINE

Ottmar Kreissl, Karlsfeld; Josef Schurrer, Deisenhofen; Karl Mötz, Munich; Wilhelm Leitgeb, Bad Neustadt, all of Fed. Rep. of Germany, and Heinz Rosenberg, Vienna, Austria, assignors to M.A.N.-Dachauer, Munich and Siemens, Erlangen, both of, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 256,818, Apr. 23, 1981, abandoned. This application Nov. 9, 1981, Ser. No. 319,666
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1980, 3016330; Aug. 9, 1980, 3030232
Int. Cl.³ F01K 23/10
U.S. Cl. 290—4 C 23 Claims



1. A method for utilizing the waste heat energy of an internal combustion engine, said method comprising driving a thermodynamic expansion machine by waste heat from an internal combustion engine, directly driving from said thermodynamic expansion machine, a synchronous machine having a non-wound rotor as an electrical power generator, connecting at least one electrical converter to the output of said generator, the rotational speed of the generator being the same as the expansion machine, driving an electric motor from said generator and delivering output from said motor to said engine to relieve the load thereon.

4,394,583

ELECTRIC FENCE ENERGIZERS

Colin A. Standing, Hamilton, New Zealand

Continuation of Ser. No. 942,870, Sep. 15, 1978, abandoned. This application Oct. 10, 1979, Ser. No. 83,366
Claims priority, application New Zealand, Sep. 13, 1977, 185174
Int. Cl.³ B23P 1/02; G05F 1/08
U.S. Cl. 307—108 5 Claims

1. An electric fence energizer of the capacitor discharge type, comprising:

an output transformer having a primary winding;

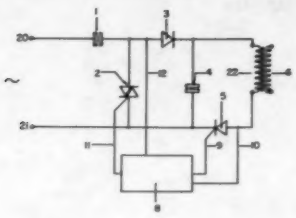
a capacitor connected across said power supply and the primary winding of said transformer;

an SCR means, connected between said capacitor and said transformer primary winding, for controllably discharging said capacitor through said transformer primary winding;

controllable switch means, connected between said power supply and said capacitor, for charging said capacitor by means of said power supply;

control circuit means for cyclically charging and discharg-

ing said capacitor by controlling said switch means and said SCR means, said control circuit means including means for charging said capacitor to substantially the same level in each cycle, said level being independent of minor fluctuations in said power supply; and



a sense line connected to said control circuit means to sense the capacitor voltage, said control circuit means including means for inhibiting charging of said capacitor when said sense line detects that said SCR means has discharged abnormally.

4,394,584

SWITCHING DEVICE FOR CHECKING THE CLOSED POSITION OF A FOLDING DOOR

Kurt Spahni, Bachs, and Walter Bucher, Reichenburg, both of Switzerland, assignors to Bauer Kassenfabrik AG., Rümlang, Switzerland

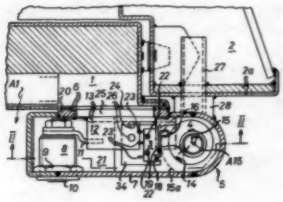
PCT No. PCT/CH79/00065, § 371 Date Jan. 3, 1980, § 102(e) Date Dec. 14, 1979, PCT Pub. No. WO79/01028, PCT Pub. Date Nov. 29, 1979

PCT Filed May 3, 1979, Ser. No. 192,523

Claims priority, application Switzerland, May 3, 1978, 4861/78

Int. Cl.³ G08B *13/08*; H01H *3/16*; H03K *17/00*; E05G *1/10*

U.S. Cl. 307—117 **7 Claims**



7. A switching device for checking the closed position of a swinging door mounted in a frame, the device being of the type in which a signal is produced by the closing movement of the door relative to the frame comprising

an infrared transmitting device in one of the door and frame;

an infrared receiving device in the other of the door and frame for producing a distinguishable signal when infrared energy is received;

circuit means including a switching transistor coupled to said transmitting device for selectively activating said receiving device to produce an alarm-activating signal in the presence of infrared energy;

means defining a plurality of ports in each of said door and frame to permit passage to infrared energy therethrough, said ports being aligned in pairs when the door is closed, said transmitting device being arranged to project energy and said receiving device being arranged to receive energy through at least one but less than all of said pairs of ports;

a pane of bullet proof glass transparent to infrared energy covering each of said ports, each said pane being undetachably fastened to its associated port;

conductor means for interconnecting said transmitting and receiving devices; and

means undetachably fastened to said door for providing a conduit for said conductor means when said door is closed and open and to inhibit tampering with said conductor means.

4,394,585

POWER CIRCUIT-BREAKER WITH REMOTE-CONTROLLABLE OPERATION THRESHOLD

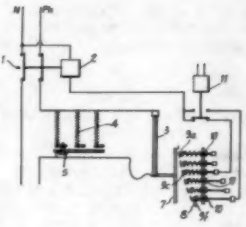
Rosette Alberti, 7 rue Marie Bonaparte, 92 210 Saint-Cloud, France

Filed May 12, 1981, Ser. No. 263,020

Claims priority, application France, May 14, 1980, 80 10861

Int. Cl.³ H01H *3/26*; H02J *1/00*

U.S. Cl. 307—140 **4 Claims**



1. A power circuit-breaker with remote-control of the operation threshold, comprising at least a detection captor of a predetermined position of the control element of the release sensitive to the intensity consumed and a release of the circuit-breaker made of an electro-magnetic element, the control element of the release being a bimetallic strip and the captor a contact element coming in contact with said bimetallic strip, when said position is reached, and sending under the control of a centralized remote-control receiver, a control current to the circuit-breaker release.

4,394,586

DYNAMIC DIVIDER CIRCUIT

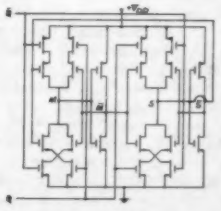
Shinji Morozumi, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Oct. 19, 1973, Ser. No. 408,148

Claims priority, application Japan, Oct. 19, 1972, 47/104830

Int. Cl.³ H03K *23/22*, *19/096*

U.S. Cl. 377—105 **17 Claims**



1. A dynamic binary divider circuit comprised of an intermediate inverter, a first multiple inverter and a second multiple inverter, said intermediate inverter being formed by the complementary connection of a P-channel transistor and an N-channel transistor, each said first and second multiple inverters

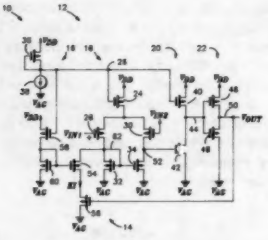
being formed from the serial connection of two-series-connected P-channel transistors to two series connected N-channel transistors respectively, the drain terminals of one of the P-channel and N-channel transistors of each multiple inverter being connected together to define an output terminal of the respective multiple inverter, the gate terminals of said one of the P-channel and N-channel transistors of each multiple inverter being connected together to define an input terminal of the respective inverter, said output terminal of said first multiple inverter being coupled through said intermediate inverter to the input of said second multiple inverter, the output terminal of said second multiple inverter being coupled to the input terminal of said first multiple inverter, the other P-channel transistor of said first multiple inverter and the other N-channel transistor of said second multiple inverter being connected for receipt at the respective gate terminals thereof with a first clock pulse and the other N-channel transistor of said first multiple inverter and the other P-channel transistor of said second multiple inverter being connected for receipt at the respective gate terminals thereof with a second clock pulse which is the complement of said first clock pulse whereby the parasitic capacitance at respective outputs of said first and second multiple inverters is utilized as a memory means, so that a division of said clock pulse applied is effected.

4,394,587

CMOS DIFFERENTIAL COMPARATOR WITH HYSTERESIS

James A. McKenzie, and Joe W. Peterson, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 27, 1981, Ser. No. 267,975
Int. Cl.³ H03K 5/24
U.S. Cl. 307—355 **4 Claims**



1. In a comparator for providing an output voltage which is proportional to the difference between a first input voltage on a gate of a first MOS transistor and a second input voltage on a gate of a second MOS transistor coupled to form a differential stage with the first transistor, a hysteresis circuit comprising:

bias current means comprising:

a third MOS transistor having a first current electrode coupled to a selected one of the first and second transistors, a gate electrode, and a second current electrode for shunting a predetermined portion of current sourced by the one transistor in an enabled condition;

a fourth MOS transistor having both a first current electrode and a gate electrode coupled to the gate electrode of said third MOS transistor, wherein said fourth MOS transistor is coupled as a master current mirror device and said third MOS transistor is coupled as a slave current mirror device; and

a current source coupled to the first current electrode of said fourth MOS transistor; and

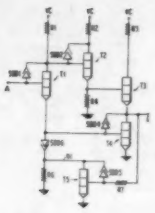
switching means coupled to the second current electrode of said third MOS transistor and to an output of the comparator, for enabling the bias current means when the output voltage of the comparator exceeds a predetermined threshold.

4,394,588

CONTROLLABLE DI/DT PUSH/PULL DRIVER

Gene J. Gaudenzi, Purdys, N.Y., assignor to International Business Machines Corporation

Filed Dec. 30, 1980, Ser. No. 221,687
Int. Cl.³ H03K 5/08, 17/08, 19/082, 19/20
U.S. Cl. 307—443 **6 Claims**



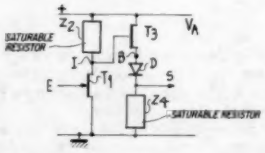
1. A circuit for limiting the time-rate of change of downgoing transitions of a signal present at the output terminal of an active collector driver, comprising a first transistor having a base coupled to a signal input terminal and a collector coupled to a means for providing a supply voltage and an emitter coupled to ground, a second transistor having a collector coupled to said output terminal and an emitter coupled to ground for pulling-down said signal present at said output terminal to a low state, impedance means coupled to said first transistor and the base of said second transistor for limiting the base current of said second transistor, pull-up means coupled to said output terminal for pulling-up said signal present at said output terminal to a high state, a feedback path coupled to said output terminal and said impedance means for limiting said time-rate of change of said downgoing transition of said output signal, and switch means for clamping said feedback path to ground.

4,394,589

LOGIC CIRCUIT INCLUDING AT LEAST ONE RESISTOR OR ONE TRANSISTOR HAVING A SATURABLE RESISTOR FIELD EFFECT TRANSISTOR STRUCTURE

Ngu T. Pham, and Gerard Nuzillat, both of Paris, France, assignors to Thomson-CSF, Paris, France

Division of Ser. No. 121,179, Feb. 13, 1980. This application Nov. 20, 1981, Ser. No. 323,535
Int. Cl.³ H03K 19/094
U.S. Cl. 307—450 **5 Claims**



1. A logic circuit comprising an input stage, wherein a first field-effect transistor is in series with a first saturable resistor interposed on the drain side in the supply of the first transistor, an output stage including a second transistor which is identical with the first and has a supply on the drain side which is common with the input stage supply, the gate of the second transistor being connected to the drain of the first transistor, the supply circuit of the second transistor being closed across a forward-biased diode, and a second saturable resistor on the ground of the common supply is connected to the source of the first transistor, an input terminal connected to the gate of the

first transistor and an output terinal tapped between the diode and the second saturable resistor;

wherein at least a selected one of the field effect transistors or the saturable resistors has a saturable resistor structure comprising a layer of semiconductor material on a semi-insulating substrate, the character and type of doping of said material being such as to set up a dipolar domain in respect of an electric field which is higher than a so-called critical value, and further comprising two ohmic contacts on said layer, wherein a groove is cut in the semiconductor layer between the ohmic contacts so as to define a residual channel in the material, the dimensions of said groove being such that the critical value of the electric field is overstepped in respect of a value of the order of one volt of the voltage between said ohmic contacts.

4,394,590

FIELD EFFECT TRANSISTOR CIRCUIT ARRANGEMENT

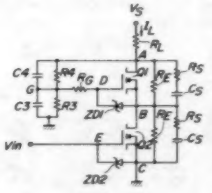
Akira Honda, Odawara, Japan, assignor to International Rectifier Corp. Japan Ltd., Kanagawa, Japan

PCT No. PCT/JP79/00330, § 371 Date Aug. 28, 1981, § 102(e) Date Jul. 7, 1980, PCT Pub. No. WO81/01924, PCT Pub. Date Jul. 9, 1981

PCT Filed Dec. 28, 1979, Ser. No. 197,099

Int. Cl.³ H03K *17/10, 17/687*

U.S. Cl. 307—584 **7 Claims**



1. A field effect transistor circuit arrangement including a plurality of field effect transistors having first and second electrodes and a control electrode, and a load (RL), which are connected in a series arrangement between a power source voltage point (Vs) and a common potential point (C), comprising:

means for applying a control pulse (Vin) to the control electrode of one of said field effect transistors which is connected in said series arrangement on the side of the common potential point;

at least one first parallel connection circuit having a first resistor and a first capacitor, each first parallel connection circuit being coupled between the control electrode of a respective one of the remaining field effect transistors and the common potential point;

at least one second parallel connection circuit having a second resistor and a second capacitor, each second parallel connection circuit being coupled between a respective first parallel connection circuit and the first electrode of one of said remaining field effect transistors which is connected in said series arrangement on the side of the power source voltage point, a capacitance of said first capacitor in said first parallel connection circuit being larger than that of said second capacitor in said second parallel connection circuit;

a Zener diode connected between the second electrode and the control electrode of each of said field effect transistors for preventing a voltage applied therebetween from exceeding a predetermined breakdown voltage between the control electrode and second electrode of each of said field effect transistors; and

said remaining field effect transistors being changed to a conductive state at the time that said control pulse is applied to said one field effect transistor.

4,394,591

LINEAR A-C GENERATOR

Sergei A. Aronov, Slavyansky bulvar, 1, kv. 396; Vladimir A. Bashilov, Prospekt Mira, 112, kv. 331, both of Moscow; Nikolai M. Volkov, Ljuberetsky raion, poselok Dzerzhinsky, ulitsa Shkolnaya, 5, kv. 187, Moskovskaya oblast, and Sergei D. Dukhovlisov, Orlikov pereulok, 8, kv. 10, Moscow, all of U.S.S.R.

Filed Mar. 17, 1978, Ser. No. 887,534

Claims priority, application U.S.S.R., Aug. 18, 1977, 2509409

Int. Cl.³ H02K *45/00*

U.S. Cl. 310—11 **4 Claims**

1. A linear a-c generator comprising: a stationary magnetic system having a magnetic circuit; n channels filled with liquid metal, each of said n channels being partially located in a gap of said stationary magnetic system and all of said channels being connected hydraulically in series to form a closed hermetically sealed loop; armatures located in said channels and being reciprocal therein; and electrodes for taking off the energy generated in said armatures.

4,394,592

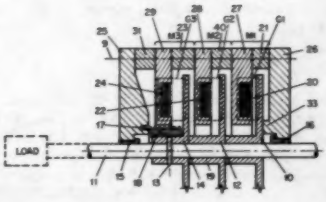
LONG STROKE LINEAR ACTUATOR

Andrew B. Pataki, Lansdale, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Sep. 29, 1980, Ser. No. 191,788

Int. Cl.³ H02K *41/00*

U.S. Cl. 310—12 **1 Claim**



1. A linear actuator for moving a shaft comprising:

a plurality of successive modules mounted on said shaft, each module including an armature, a spacer and a flange;

a first one of said modules being adjacent an endplate;

only said first module having an armature fixedly connected to said shaft;

means for urging each armature into engagement with an adjacent armature, said means including a resilient member only in said first module between said endplate and said fixed armature;

said first module flange and armature having a gap therebetween;

each module armature and flange having a gap therebetween; and

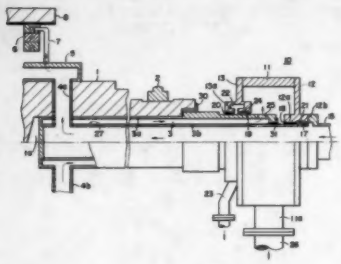
said first module gap being greater than any successive module gap.

4,394,593

LIQUID COOLED DYNAMOELECTRIC MACHINES

Yoshitsugu Gocho, Fujisawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Jul. 29, 1981, Ser. No. 287,909
Claims priority, application Japan, Aug. 14, 1980, 55-111023
Int. Cl.³ H02K 9/00
U.S. Cl. 310—54 3 Claims



1. An apparatus for assisting in the liquid cooling of a dynamoelectric machine comprising a hollow rotor shaft; a double wall tube assembly defining an annular space, said tube assembly secured in said hollow rotor shaft in such a manner that an outer tube of said assembly extends outwardly beyond a distal end of the rotor shaft, and an inner tube of said assembly extends outwardly beyond a distal end of said outer tube; a stationary frame surrounding a portion of said tube assembly extending out of the rotor shaft, said stationary frame defining therein an exhaust chamber communicating with said annular space between said outer tube and said inner tube; means for supplying cooling water into said inner tube; means for exhausting cooling water from said chamber; means for sealing gaps between said stationary frame and said tube assembly; a first bushing between said distal end of the rotor shaft and said outer tube so that the outer tube is axially slidable relative to said first bushing; a second bushing between said distal end of the outer tube and said inner tube such that the inner tube is axially slidable relative to said second bushing, each of the first and second bushings being made of a rigid material; and a layer of a low heat conductivity material covering the outer surface of said inner tube.

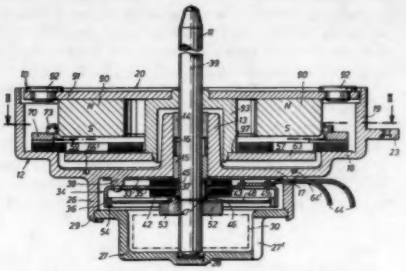
4,394,594

MOTOR WITH A DISK ROTOR

Fritz Schmider, Hornberg, and Rolf Müller, St. Georgen, both of Fed. Rep. of Germany, assignors to Papst-MOTOREN KG, St. Georgen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 52,831, Jun. 28, 1979, abandoned, which is a division of Ser. No. 708,092, Jul. 23, 1976, Pat. No. 4,174,484. This application Jul. 24, 1980, Ser. No. 171,810
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1979, 2934183
Int. Cl.³ H02K 11/00
U.S. Cl. 310—68 R 31 Claims

1. Brushless d.c. motor comprising a multipolar permanent magnet rotor having at least 6 poles, stator means comprising a plurality of ironless coils arranged in a one layer winding arrangement, said coils being connected to form a plurality of phase windings (122, S1–S4), rotor position sensing means (76,77; 254,255; 254',255'; 296,297) for controlling the currents in said phase windings so as to obtain four current pulses per rotor rotation angle of 360 electrical degrees and to create in operation a rotary magnetic field driving said permanent magnet rotor, said winding arrangement comprising two sets of coils, each set comprising at least one pair of coils electrically connected with each other and oppositely poled with respect to each other and spaced from each other by (2n+1)·180 elec-



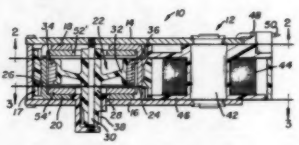
trical degrees between centers, where n is a low positive integer.

4,394,595

STATOR ARRANGEMENT FOR A SYNCHRONOUS MOTOR

Robert F. Weaver, Jamestown, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 965,996, Dec. 4, 1978, abandoned. This application Sep. 8, 1980, Ser. No. 185,330
Int. Cl.³ H02K 21/00
U.S. Cl. 310—162 7 Claims



1. A method of providing good starting characteristics in a synchronous motor which includes inter-meshed stator poles and a permanent magnet rotor with rotor poles rotating with said inter-meshed stator poles and wherein a field coil which generates flux to cause said rotation of said rotor is disposed adjacent said inter-meshed stator poles in a side-by-side relationship, the method comprising:

(a) providing shading means for a predetermined number of said stator poles to provide a group of shaded poles and a group of unshaded poles,

(b) selecting a reference pole from each of said groups,

(c) determining the flux phase difference between said reference pole and individual poles of a group,

(d) converting said phase difference to a mechanical angle and locating said individual poles with respect to each other according to said mechanical angle.

4,394,596

THREE-PHASE INDUCTION MOTOR

Tadatomo Kimura, Yotsukaichi, and Takeshi Noguchi, Mie, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 9, 1981, Ser. No. 300,553
Claims priority, application Japan, Sep. 16, 1980, 55-128309
Int. Cl.³ H02K 3/00
U.S. Cl. 310—184 6 Claims

1. A three-phase induction motor comprising:

first to sixth phase terminals, said fourth to sixth phase terminals being connected to said first to third phase terminals, respectively, during full drive of the motor;

a cylindrical stator core;

six coil group arranged on the hollow cylindrical core at equal intervals in the circumferential direction of the stator;

the coils of a first group being wound about a first one-sixth of the core and divided into first and second sub-groups each having N turns;

the coils of a second group adjacent the first group being wound about a second one-sixth of the core and divided into third and fourth sub-groups each having N turns

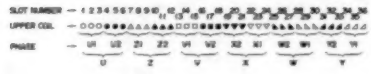
the coils of a third group adjacent the second group being wound about a third one-sixth of the core and divided into fifth and sixth sub-groups each having N turns

the coils of a fourth group adjacent the third group being wound about a fourth one-sixth of the core and divided into seventh and eighth sub-groups each having N turns

the coils of a fifth group adjacent the fourth group being wound about a fifth one-sixth of the core and divided into ninth and tenth sub-groups each having N turns;

the coils of the sixth group adjacent the fifth group being wound about the last one-sixth of the core and divided into eleventh and twelfth sub-groups each having N turns,

said sixth sub-group having M turns ($M \leqq N$) arranged adjacent M turns of the seventh sub-group, said first sub-group having M turns arranged adjacent M turns of said twelfth sub-group, said first and eighth sub-groups being connected in series between said first and second phase terminals to constitute a first subassembly of coils, said fifth and twelfth sub-groups being connected in series between said



second and third phase terminals to constitute a second sub-assembly of coils, said tenth and third sub-groups being connected in series between said third and first phase terminals to constitute a third sub-assembly of coils, said second and seventh sub-groups being connected in series between the fourth and fifth phase terminals to constitute a fourth sub-assembly of coils, said sixth and eleventh sub-groups being connected in series between said fifth and sixth phase terminals to constitute a fifth sub-assembly of coils, and said ninth and fourth sub-groups being connected in series between said sixth and fourth phase terminals to constitute a sixth sub-assembly of coils,

wherein at the start of the motor a first-phase voltage is applied to the first phase terminal, a second-phase voltage is applied to the second phase terminal and the third-phase voltage is applied to the third phase terminal, and during the full drive of the motor the first-phase voltage is applied to the first and fourth phase terminals, the second-phase voltage is applied to the second and fifth phase terminals and the third-phase voltage is applied to the third and sixth phase terminals, thus causing the first and fourth sub-assemblies to form a first assembly of coils, the second and fifth sub-assemblies to form a second assembly of coils and the third and fifth sub-assemblies to form a third assembly of coils, whereby three-phase voltage is applied to the coils of said first, third, fifth, eighth, tenth and twelfth sub-groups at the start of the motor and to all the sub-groups during the full drive of the motor.

4,394,597

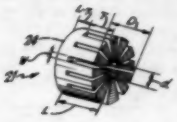
MULTIPLE POLE AXIAL FIELD ELECTROMAGNETIC DEVICES

Joseph A. Mas, Morristown, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 15, 1980, Ser. No. 187,244

Int. Cl.³ H02K 1/22

U.S. Cl. 310—268 **46 Claims**



1. In an axial field electromagnetic device including a rotor and a stator formed of core elements that delimit a selected number of poles, the improvement comprising:

a core element in the form of a cylinder having an annular cross section and two opposed annular core faces at either end thereof, said cylinder having an axial thickness (L) separating said faces and a plurality of radial slots disposed in one of said faces, each of said slots having a width (W), a depth (T) and a slot area (slot width times slot length),

said slotted face having a face area (A_f) equal to the difference between the annular cross-sectional area of said core and the total of said slot areas,

said radial slots being sized such that the sum of said slot widths per hole is between approximately 30% to approximately 90% of said axial thickness, said slot depth is between approximately 45% to approximately 75% of said axial thickness and the total of said slot areas is between approximately 27% to approximately 180% of said remaining face area (A_f).

4,394,598

SPARK PLUG FOR INTERNAL COMBUSTION ENGINES

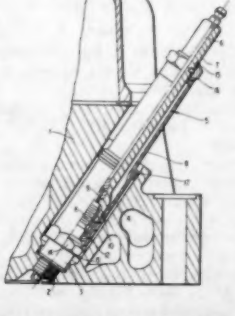
Horst Bergmann, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 1, 1980, Ser. No. 211,901

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1979, 2948043

Int. Cl.³ H01J 5/48; H01T 13/04

U.S. Cl. 313—51 **11 Claims**



1. An assembly for a spark plug deeply arranged in a spark plug recess provided in an intrnal combustion engine, the spark plug comprising a mounting portion, a center electrode means, and an insulating body, comprising

extension means adapted to be attached to the spark plug for facilitating access thereto, the extension means includes a center electrode, an insulating means, and a tubular jacket with at a first end an inner cross-sectional configuration corresponding to a cross section of the mounting portion of the spark plug, and at a second end a mounting means,

means for enabling an attachment of the insulating body and center electrode of the extension means to the spark plug,

means for retaining the tubular jacket at the insulating means of the extension means,

means for sealing the first end of the tubular jacket with respect to an insulating body of the spark plug,

means for sealing the second end of the tubular jacket with respect to the insulating body of the extension means, and

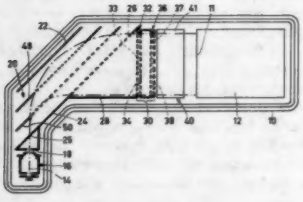
means for sealing the tubular body with respect to the spark plug recess.

4,394,599

FLAT CATHODE RAY TUBE

James Smith, Reigate, and Daphne L. Lamport, Caterham, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,269
Int. Cl.³ H01J *29/46*
U.S. Cl. 313—422 **8 Claims**



1. A flat cathode ray tube including an electron gun for producing an electron beam, first means for deflecting the beam in a first direction, means for accelerating the deflected beam, second means for deflecting the accelerated beam in a second direction, and a pair of spaced-apart electrodes defining a trajectory control space into which the beam is directed by the second means, said electrodes including a screen and a repeller electrode for repelling the beam toward the screen,

characterized in that the accelerating means comprises successively-arranged first and second lenses, each of said lenses accelerating and converging the beam, said first lens converging the beam to form an object for the second lens.

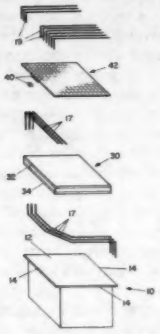
4,394,600

LIGHT EMITTING DIODE MATRIX

Alfred Flannagan, Weston, Canada, assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jan. 29, 1981, Ser. No. 229,489
Int. Cl.³ H01L *25/04*
U.S. Cl. 313—500 **4 Claims**

1. In a light emitting diode matrix, a substrate having, in order, first, second, third, and fourth adjacent edges; a first plurality of light emitting diodes, each having an anode electrode centered on its anode end face and a plurality of cathode electrodes positioned around the periphery of its cathode end face, arranged in rows and columns of a rectangular coordinate system; a second plurality of row conductors, equal in number to the number of rows of said diodes, each electrically contacting the anode electrodes of said diodes of its respective row; a third plurality of column conductors, equal in number to the number of said columns of diodes, each electrically contacting the cathode electrodes of its respective column and thence extending over said first edge of said substrate; said anodes and said row conductors being positioned upon a first surface of said substrate, with said anodes directed toward said substrate, with said column conductors contacting said cathode electrodes on the outer surface of said matrix and each having a fourth, equal to said second plurality of row conductors, plurality of openings formed therein and positioned over the non-electrode portions of the cathode surfaces of said diodes; the improvement comprising:



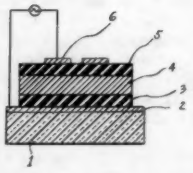
said row conductors extending in rows along said first surface of said substrate, thence over said second edge of said substrate, thence extending in rows from said second edge on the second surface of said substrate, the positions of said row conductors on said second surface being contoured to turn through a right angle, and thence to said third edge of said substrate.

4,394,601

ZnS:Mn THIN-FILM ELECTROLUMINESCENT ELEMENT WITH MEMORY FUNCTION

Mikio Takeda, Tenri; Yoshinobu Kakihara, Nara; Masaru Yoshida, and Yukihiko Nakata, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 486,096, Jul. 5, 1974, abandoned. This application May 18, 1977, Ser. No. 798,008
Int. Cl.³ H05B *33/14, 33/18, 33/22*
U.S. Cl. 313—509 **3 Claims**

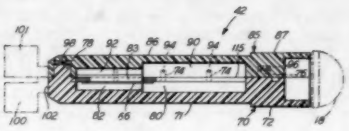


1. A ZnS:Mn thin-film electroluminescent element containing a hysteresis memory function which comprises a ZnS:Mn thin-film electroluminescent layer containing ZnS polycrystalline grains having a diameter of 0.05 to 0.2μ and containing Mn in a concentration of 0.05 to 5.0 weight percent, said Mn serving as a luminescent center, said electroluminescent layer being sandwiched between a pair of dielectric layers, at least one of the dielectric layers being made of Y_2O_3, and first and second electrodes provided on the respective dielectric layers, said ZnS:Mn electroluminescent layer having a thickness of 0.4–2.0μ and a dielectric constant at 1 KHz of about 10 to 22, a loss tangent at 1 KHz of about 1 to 4×10^3, and a breakdown strength of about 3 to 4×10^6 V/cm.

4,394,602
ENCLOSED ELECTRICAL DEVICES

Waldo D. Apgar, Reading; Charles L. Davis, Mohnton; Loring D. Emery, Jr., Hamburg; Werner F. Esselnhn, Wyomissing, and Walter R. Holbrook, Reading, all of Pa., assignors to Western Electric Co., Inc. and Bell Telephone Laboratories, Inc., both of New York, N.Y.

Filed Nov. 25, 1981, Ser. No. 324,757
Int. Cl.³ H01J 7/44
U.S. Cl. 315—71 20 Claims

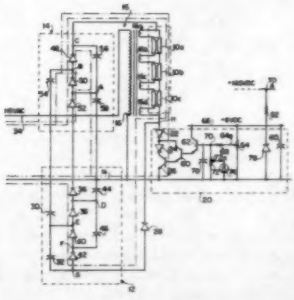


1. An enclosed electrical device, comprising:
an arrangement of circuit elements including conductive elements lying substantially in and along a plane;
a first enclosure member applied to a first side and a second, separate enclosure member applied to a second side of the circuit elements for at least partially enclosing said circuit elements; means in one or more conductive elements for permitting penetration of such elements;
means for penetrating conductive elements in the circuit for fixedly restraining such elements; and
means associated with said enclosure members for fixedly engaging the penetrating means such that the enclosure members and the circuit elements are fixed relative to one another in a secure assembly.

4,394,603
ENERGY CONSERVING AUTOMATIC LIGHT OUTPUT SYSTEM

Don F. Widmayer, Bethesda, Md., assignor to Controlled Environment Systems Inc., Rockville, Md.

Continuation of Ser. No. 945,842, Sep. 26, 1978, abandoned, which is a continuation-in-part of Ser. No. 849,427, Nov. 7, 1977, abandoned. This application Apr. 2, 1981, Ser. No. 250,410
Int. Cl.³ H05B 41/16, 41/36
U.S. Cl. 315—311 42 Claims

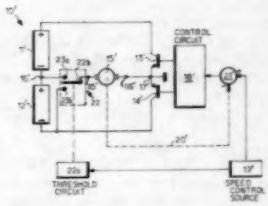


25. An energy conserving light output control system for firing and maintaining arc current flow through a plurality of fluorescent lamps, said system comprising:
arc current supply means comprising a first voltage multiplying means, including a plurality of capacitors and diodes in accordance with the number of lamps, for supplying arc current to said fluorescent lamps after said fluorescent lamps have been fired;
ionizing power supply means comprising a second voltage multiplying means, including a plurality of capacitors and diodes in accordance with the number of lamps, for providing, in cooperation with said arc current supply means, an ionizing voltage for firing the lamps and for providing a low voltage after said lamps are fired;
said arc current supply means constituting means for providing a non-dissipative decline in the voltage supplied to the lamps with an increase in the lamp load current;
light sensing means for sensing the total ambient light including the light output of the lamps as well as the ambient light produced by other light sources; and
feedback menas, including a solid state current control device connected in the arc current path of said lamps, for controlling the amplitude of the current in said arc current path in accordance with the output of said light sensing means so as to maintain the total ambient light at a substantially constant level.

4,394,604
CONTROL APPARATUS FOR AN ELECTRO-MECHANICAL DEVICE THAT GENERATES A BACK EMF

Andre Brecy, Frahier, and Francois Gradler, Bellort, both of France, assignors to Cii Honeywell Bull, Paris, France

Continuation of Ser. No. 17,918, Mar. 6, 1979, abandoned. This application May 14, 1981, Ser. No. 263,740
Claims priority, application France, Mar. 24, 1978, 78 08618
Int. Cl.³ H02P 1/22
U.S. Cl. 318—257 4 Claims

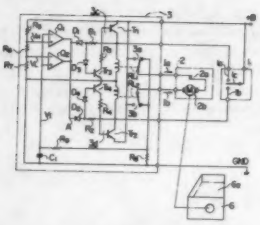


1. Apparatus for controlling the speed and running direction of a d.c. motor comprising first and second transistors having emitter collector paths, electrodes of said paths having a first common connection, a d.c. power supply having first and second output electrodes and an intermediate tap, the voltages at the first and second output electrodes being respectively at potentials greater than and less than the voltage at the tap, means for connecting the motor in circuit with the power supply, the first common connection and the paths so current flows through the motor in a first direction between the first output electrode and the tap through the path of the first transistor and in a second direction through the motor between the second output electrode and the tap through the path of the second transistor, said means for connecting including means for altering the motor connections to the power supply so current flows in the first direction through the motor between the first and second output electrodes through the path of the first transistor and the total voltage between the first and second output electrodes is connected across the first transistor and motor.

4,394,605
LOAD DRIVE CONTROL SYSTEM

Hidehito Terazawa, Oobu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 24, 1981, Ser. No. 237,778
Claims priority, application Japan, Feb. 29, 1980, 55-25511
Int. Cl.³ H02P 1/22
U.S. Cl. 318—280 13 Claims

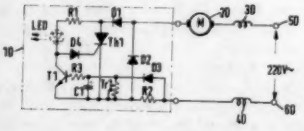


1. A load drive control system comprising:
instruction means for selectively producing forward and reverse drive instruction signals for starting the driving of a controlled load in forward and reverse directions respectively;
signal holding switching means for holding a forward or reverse signal corresponding to the forward or reverse drive instruction signal from said instruction means;
said instructions means comprising an automatically-restoring switch which switches by receiving an actuation force to generate one of said instruction signals and restores when the actuation force is released to stop the generation of the one instruction signal;
reversible motor means for driving said load in either forward or reverse direction;
means responsive to said signal holding switching means for controlling electric current supplied from a power supply to said motor means;
current detecting means for detecting the magnitude of the current supplied to said motor means;
and upper and lower limit detecting means responsive to said current detecting means for releasing the holding action of said holding switching means when the motor supplied current becomes higher or lower than an upper or lower limit respectively.

4,394,606
SPEED CONTROL CIRCUIT FOR ELECTRIC MOTOR

Peter Woerwag, Stuttgart, Fed. Rep. of Germany, assignor to Dupro A.G., Romanshorn, Fed. Rep. of Germany

Filed Nov. 21, 1980, Ser. No. 209,154
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1979, 2946930
Int. Cl.³ H02P 5/06
U.S. Cl. 318—434 10 Claims

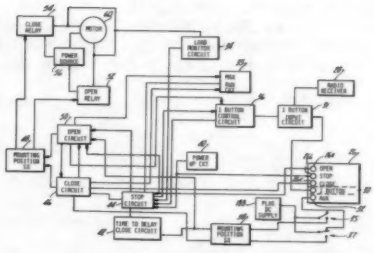


1. An apparatus for cleaning textile floor coverings, said apparatus including a roller shaped brush, an electric motor for rotating said roller shaped brush, and a suction device for evacuating dirt and dust particles from said floor covering, said motor connected to an alternating current supply and having a load current passing therethrough and an adjustable rotational speed, a circuit arranged in the load circuit of the motor to control the rpm of the motor as a function of its load current, comprising:
(a) a measuring resistance connected in said load circuit for producing a measuring signal proportional to said load current;
(b) a thyristor having an anode and a cathode and being connected in at least one branch of said load circuit:
(c) a control circuit connected to actuate said thyristor, said control circuit comprising a series circuit arranged in parallel to the anode and cathode of said thyristor, said series circuit including a coupling resistor and a switching transistor having an emitter and a collector, said coupling resistor being connected to the collector of said switching transistor;
(d) said thyristor having a control electrode connected through a diode to the collector of said switching transistor, said switching transistor having a base electrode connected through a resistance to a parallel circuit comprising a capacitor and a variable resistor, and a diode connecting said measuring signal from said measuring resistance to said resistance in series with said switching transistor base electrode.

4,394,607
CONTROL SYSTEMS FOR GATES AND THE LIKE INCLUDING A MOTOR OVERLOAD MONITORING CIRCUIT

Rodger P. Lemirande, Riverview, Mich., assignor to Stanley Automatic Openers, Detroit, Mich.

Filed May 8, 1981, Ser. No. 261,846
Int. Cl.³ H02P 1/16
U.S. Cl. 318—453 28 Claims

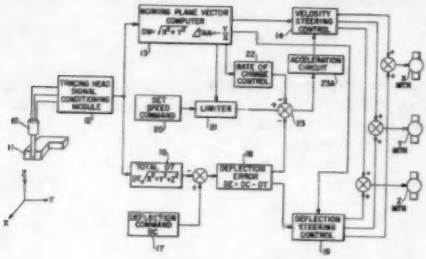


1. Apparatus for controlling the current delivered through an electrical motor, comprising:
means for producing a measured level of voltage proportionate to the magnitude of current flowing through said motor;
means for generating a first reference level of voltage;
means coupled with said producing means and said generating means for comparing the magnitude of said first reference level of voltage with said measured level of voltage and for producing a first output signal when said measured level exceeds said first reference level;
means for generating a second reference level of voltage;
means for comparing the magnitude of said second reference level of voltage with said measured level of voltage and for producing a second output signal when said measured level exceeds said second reference level; and,
means responsive to either of said first and second output signals for interrupting delivery of electrical current to said motor.

4,394,608
MACHINE TOOL TRACING SYSTEM

Robert E. Tryber, and George A. Hoffman, both of Racine, Wis., assignors to Gettys Manufacturing Co., Inc., Racine, Wis.

Filed Nov. 20, 1980, Ser. No. 208,698
Int. Cl.³ G05B 19/36
U.S. Cl. 318—578 8 Claims

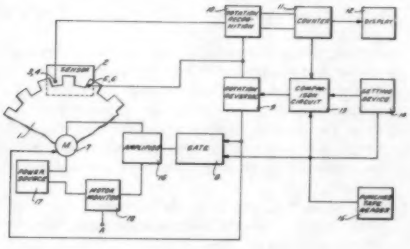


1. A control system wherein a stylus traces a contour around a template, and wherein the template moves relative to the stylus in response to deflection of the stylus by moving contact with the template, comprising means for detecting a rate of change of the deflection angle of the stylus from said template, and means for producing a signal for controlling the magnitude of the velocity of said template relative to said stylus in response to the rate of change of deflection angle.

4,394,609
CONTROL PROVISION OPERATION FOR PRINTING MACHINES

Max Janicki; Hans-Georg Liefke; Reinhart Keil, and Gerd Geyer, all of Leipzig, German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz", Leipzig, German Democratic Rep.

Filed Apr. 3, 1981, Ser. No. 250,703
Claims priority, application German Democratic Rep., Apr. 10, 1980, 220348
Int. Cl.³ G05B 19/28
U.S. Cl. 318—603 13 Claims

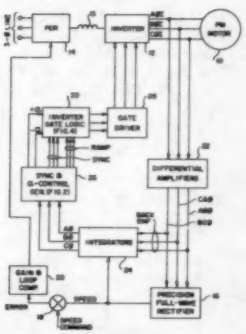


1. Control provision for final control elements of a printing machine wherein a rotatable final control element is driven by a motor, comprising a pulse generating disk attached to the final control element of the printing machine and axially centered therewith, said disk having recesses regularly spaced from the axis; sensing means having two sensing points disposed at a radial distance from the axis suitable for engaging the recesses of the disk, said sensing means sensing the position of the recesses at said two sensing points; a recognition circuit connected to said sensing means and processing signals coming from said sensing means for recognizing the rotary direction of the final control element; an electronic counter connected to said recognition circuit and counting signals provided by said sensing means; a comparison circuit connected to the electronic counter; a set value provision connected to said comparison circuit and providing preset setting values, said comparison circuit comparing the results of counting with values provided by said set value provision to obtain a deviation signal; a device for reversal of a direction of rotation of the motor connected to said comparison circuit and to said recognition circuit and providing for reversal of direction of rotation of the motor upon appropriate deviation signal; gate means connected to the set value provision and to said device for reversal and providing a gate signal; and a motor control circuit connected to the motor and to the gate means and operative for controlling the final control element by employing the gate signal.

4,394,610
ADAPTIVE REFERENCE VOLTAGE GENERATOR FOR FIRING ANGLE CONTROL OF LINE-COMMUTATED INVERTERS

Carlisle R. Dolland, Torrance, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 7, 1981, Ser. No. 291,131
Int. Cl.³ H02P 5/34
U.S. Cl. 318—803 6 Claims



1. Apparatus for generating an adaptive reference voltage for use as a firing angle control signal in a system for control of a line-commutated inverter using information from integrated back EMF signals from a high speed multiphase permanent magnet motor comprising

means of combining 120° segments of said integrated back EMF signals symmetrical about their maxima of one polarity into a composite wavform, and

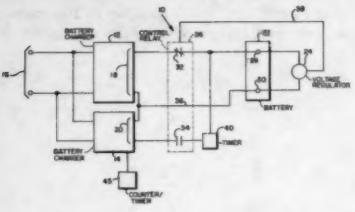
means for sampling said maxima of said composite waveform and holding each maximum until the next sampling, thereby generating a voltage to be used as a reference for comparison with said integrated back EMF signals for control of the firing angle of said inverter that is proportional to the amplitude of said integrated back EMF signals, whereby any change in amplitude of said integrated back EMF signals will not effect a change in the operating power factor of said motor and inverter.

4,394,611

METHOD FOR CHARGING A STORAGE BATTERY

William H. Fallon, Cleveland; William R. Schober, Avon Lake, both of Ohio; Edward O. Neukirch, and Donald W. Kirby, both of Reading, Pa., assignors to General Battery Corporation, Reading, Pa.

Filed Oct. 20, 1980, Ser. No. 198,341
Int. Cl.³ H02J 7/00
U.S. Cl. 320—21 21 Claims



1. A method for charging a storage battery, the method comprising:

a. charging the battery at a first rate during a first portion of a charging cycle;

b. charging the battery at a second rate, lower than the first rate, during a second portion of the charging cycle; and

c. periodically interrupting the charging, at fixed, timed intervals, during the second portion of the charging cycle;

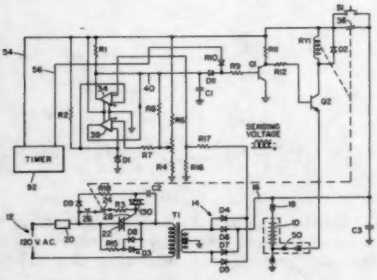
d. wherein the interruption of the charging cycle defines a duty cycle wherein approximately one sixth of the charging cycle is interrupted during the second portion of the charging cycle.

4,394,612

BATTERY CHARGING CIRCUIT

Emil Emerle, Mount Prospect, and Alex F. Gawron, Park Ridge, both of Ill., assignors to Skil Corporation, Chicago, Ill.

Filed Jan. 4, 1982, Ser. No. 336,891
Int. Cl.³ H02J 7/04
U.S. Cl. 320—31 8 Claims



1. A circuit for controlling fast charging of battery cells to prevent damage to said cells comprising:

(a) charging means for producing a rectified charging voltage and applying said charging voltage to said cells,

(b) first comparison means for detecting when the charging voltage is at or below a selected value corresponding to a minimum trough voltage value and producing an output indicative thereof,

(c) second comparison means for detecting when the trough voltage of said cells exceeds a reference voltage corresponding to the full charge value of said cells and producing an output indicative thereof,

(d) means responsive only to the combined outputs of said first and second comparison means for terminating charging of said cells by disabling said charging means,

whereby fast charging is terminated only if the trough voltage exceeds said reference voltage during a time period when the charging voltage is below said selected value.

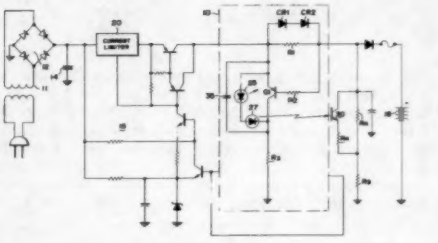
3. The circuit according to claim 1 or claim 2 further including thermostatic contacts in thermal relation with said cells, said contacts opening if the temperature of the cells exceeds a selected value thereby to terminate fast charging.

4,394,613

FULL-CHARGE INDICATOR FOR BATTERY CHARGERS

Steven W. Cole, Covina, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Jan. 19, 1981, Ser. No. 225,961
Int. Cl.³ H02J 7/10; G01R 19/165
U.S. Cl. 320—48 8 Claims



5. In a battery charger, a circuit for protecting the battery from being overcharged, comprising

control means in the charging current path for providing less than a preselected voltage drop thereacross when the charging current level is less than a known level which is related to full-charge battery state,

a resistive network connected between a conductor along which current is conducted into said battery and a source of reference potential for said battery,

a transistor switch having its base-emitter junction connected across said control means to switch from one conduction state to a second state when the voltage drop across said control means is less than said preselected voltage drop, and

switching means for reducing the resistance provided by said network when the voltage across said control means is less than said preselected voltage drop, said switching means comprising a photocoupler responsive to said transistor switch to emit light when said transistor switch is switched to said second state and a photocoupler transistor connected in parallel with a portion of said resistive network,

whereby light from said photocoupler activates said photocoupler transistor to reduce the resistance provided by said network.

4,394,614

STATIC VAR GENERATORS

Michael B. Brennen, Wilkins Township, Allegheny County; Laszlo Gyugyi, and Eric J. Stacey, both of Penn Hills Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 15, 1981, Ser. No. 302,349
Int. Cl.³ H02J 3/18
U.S. Cl. 323—210 2 Claims

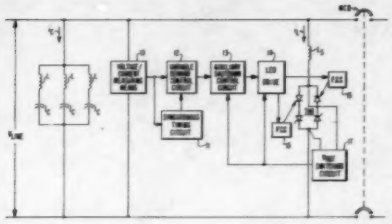
1. A static VAR generator, comprising:

(a) a capacitive current means disposed for connection into an AC network;

(b) a monitoring means connected to said AC network for

monitoring the capactive current requirement of the AC network;

(c) a control means connected to said capacitive current means and said monitoring means for causing connection of said capacitive current means into said AC network in response to the reactive requirements of said AC network;



(d) switching means for connecting said capacitive current means into said AC network; and

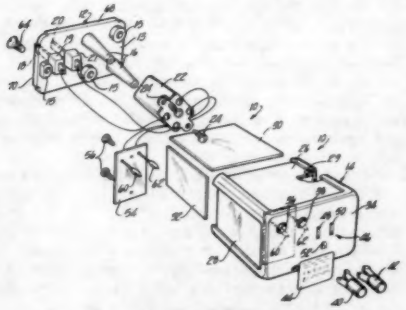
(e) an auxiliary shutdown means for allowing said switching means to disconnect said capacitive current means from the AC network without causing restriking transients in the event of failure of said monitoring means or said control means.

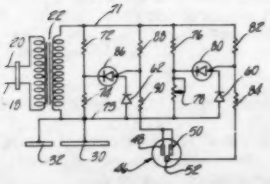
4,394,615

APPARATUS FOR TESTING THE QUALITY OF THE GROUND CONNECTION AND THE INSULATION QUALITY IN AN ELECTRICAL HAND TOOL OR THE LIKE

Joseph A. Rocci, Jr., 12243 S. 71st Ave., Palos Heights, Ill. 60463

Filed Mar. 10, 1980, Ser. No. 128,499
Int. Cl.³ G01R *31/02, 31/12*
U.S. Cl. 324—51 **4 Claims**





1. Apparatus for testing the quality of a ground connection between the plug of an electrical hand tool or the like and the tool housing, said apparatus comprising

a rectangular enclosure of molded plastic non-conductive construction and having a flat plate of conductive metallic construction secured to said enclosure as a first flat external wall of said rectangular enclosure,

an electrical plug including at least first and second prongs rigidly carried by and projecting outwardly from a second wall of said enclosure other than said first wall and adapted to be received into first and second power receptacles of a utility power outlet,

a three-receptacle electrical outlet carried by a third wall of said enclosure other than said first and second walls and adapted to receive a said tool plug having three prongs, with one of said three prongs being a tool ground prong and one of said three receptacles being a ground receptacle for receiving said tool ground prong,

first electrical circuit means disposed within said enclosure and connected to said first and second prongs for receiving electrical power and to said ground receptacle and said plate, said first circuit means being responsive to electrical resistance between a tool housing in physical contact with said plate and the ground prong of a tool plug received in said three-receptacle outlet,

said first circuit means, said enclosure including said plate and said three-receptacle outlet being electrically isolated from utility ground at said utility power outlet,

second circuit means disposed within said enclosure and connected to said first and second prongs for receiving electrical power, to said plate and to both receptacles in said three-receptacle outlet other than said ground receptacle, said second circuit means being responsive to electrical resistance between a tool housing in physical contact with said plate and prongs of a tool plug other than the ground prong,

first indicating means visibly disposed on said enclosure and responsive to said first circuit means for indicating the quality of a ground connection within a said tool between the tool plug and the tool housing, and

second indicating means separate from said first indicating means visibly disposed on said enclosure and responsive to said second circuit means for indicating the quality of insulation within the tool between the said other prongs and the tool housing,

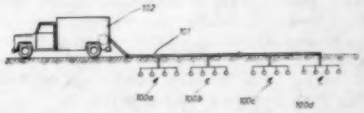
said first and second circuit means being connected to said prongs, said plate and said receptacles in said three-receptacle outlet to operate independently of each other for indicating the quality of said ground connection and the quality of said insulation independently of each other.

4,394,616

CABLE BREAK LOCATOR

Edward M. Browne, and Miles A. Smither, both of Houston, Tex., assignors to Geosource Inc.

Filed Nov. 17, 1980, Ser. No. 207,636
Int. Cl.³ G01R *31/08, 11/52*
U.S. Cl. 324—52 **8 Claims**



1. A method of determining the location of a break in a given pair of wires in a multi-pair cable, comprising the steps of:

(a) shorting one wire of the given pair and all other wires in the cable to ground;

(b) applying a variable frequency AC current source across the given pair to develop an AC voltage across the given pair;

(c) multiplying the AC voltage developed across the given pair by a second AC signal, which has a quadrature phase relationship to the AC current source to form a product

signal having a DC component proportional to the quadrature component of the AC voltage across the given pair; and

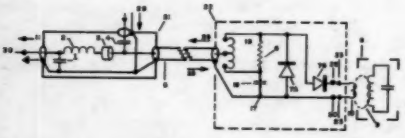
(d) comparing the DC component of said product signal to a reference signal, said reference signal having a value which is inversely proportional to the capacitance of an unbroken pair.

4,394,617

SWEPT-DIP PROBE

E. Lawrence Wampler, 6708 Bostwick Dr., Springfield, Fairfax County, Va. 22151

Filed Nov. 18, 1981, Ser. No. 298,657
Int. Cl.³ G01R *27/00*
U.S. Cl. 324—57 Q **6 Claims**



1. A probe comprising a detachable coupling link acting as a primary winding of a transformer, a secondary is formed by the network-under-test coupling inductance; one terminal of the primary is series connected to a diode, the second terminal of the primary winding is connected to the outer conductor of a coaxial transmision line; the second terminal of the diode is connected to the center conductor of the coaxial transmission line; the purpose of the diode is to couple rectified r.f. energy to the primary winding of the transformer and to rectify the r.f. energy for measurement of the circuit resonance parameter; the coaxial transmission line center conductor and the first diode junction are connected to a second diode; the second diode, rectifies the r.f. energy in phase opposition to the first diode, the opposite terminal of the second diode is connected to the outer conductor of the coaxial transmission line; an analog signal that is a net result of the rectification by the two diodes is carried by the transmission line to the r.f. energy-analog signal combiner/separator; the input to the combiner/-separator is the r.f. energy source and the output is the analog signal representation of the resonance response curve that is a frequency function of the network-under-test; the analog signal is displayed by a suitable display device with radio frequency on one axis, driven by the frequency sweep analog waveform and on the other axis is the network response function driven by the probe analog waveform, a result of probe coupling to the network-under-test; and,

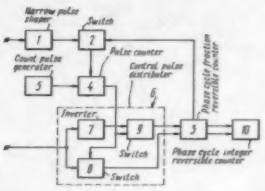
including a r.f. frequency-analog signal combiner/separator for processing the signals and comprised of an r.f. input connection, a r.f. signal output, coupled to the probe coaxial cable center conductor through a d.c. blocking capacitor; the coaxial cable center conductor is also connected to an r.f. choke first end, and the r.f. choke second end is connected to the display device, the display device end of the r.f. choke, the second end, is connected to a r.f. bypass capacitor; the opposite end of the r.f. bypass capacitor is connected to the common circuit point of the system, thus forming a lowpass filter.

4,394,618

DIGITAL TRACKING PHASE METER

Viktor P. Maiko, Gelendzhik, U.S.S.R., assignor to Juzhnoe Proizvodstvennoe Obiedinenie Po Morskim Geologorazvedochnym Rabotam "JUZHMORGEOLOGIA", Gelendzhik, U.S.S.R.

Filed Feb. 19, 1981, Ser. No. 236,110
Int. Cl.³ G01R *25/00*
U.S. Cl. 324—83 D **1 Claim**



1. A digital tracking phase meter, comprising:

a narrow pulse shaper, the input of which serves as a first input of said digital tracking phase meter to which square signals are applied, and the output of which shapes pulses corresponding to the leading edge of said input signal;

a first switch, the first input of which is connected to said output of said narrow pulse shaper, with said first switch incorporating a second input and an output;

a pulse counter comprising an input, a countdown input, an output, with said input connected to said output of said first switch;

a count pulse generator, the output of which is connected to said countdown input of said pulse counter;

a control pulse distributor incorporating a first input serving as a second input of said digital tracking phase meter to which said input square pulses are applied, a second input connected to said output of said pulse counter, and first and second outputs;

a phase cycle fraction reversible counter incorporating countup and countdown inputs connected respectively to said first and second outputs of said control pulse distributor, a first data output connected to said second input of said first switch, and second and third outputs;

a second switch included in said control pulse distributor and furnished with a first input which is said first input of said distributor, a second input which serves as said second input of said distributor, and said output serves as a first output of said distributor;

an inverter included in said control pulse distributor and furnished with an input connected to said first input of said second switch and an output;

a third switch included in said control pulse distributor and furnished with a first input connected to said output of said inverter, with a second input connected to said second input of said second switch, and with an output serving as said second output of said distributor; and

a phase cycle integer reversible counter incorporating countup and countdown inputs connected to said second and third outputs of said phase cycle fraction reversible counter, respectively.

4,394,619

HALL PROBE WITH AUTOMATIC CONNECTING MEANS

Martin Gschwandtner, Hof bei Salzburg, Austria, assignor to Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft, Braunau am Inn, Austria

Filed Oct. 3, 1980, Ser. No. 193,667
Claims priority, application Austria, Oct. 5, 1979, 6513/79
Int. Cl.³ G01R *19/00*
U.S. Cl. 324—117 H **6 Claims**

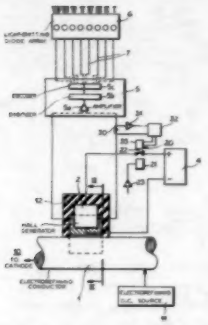
1. In an electrolysis system in which a current carrier is

connected between a current source and an electrode, a device for monitoring the amplitude of the current in said carrier, said device comprising:

a Hall generator;

means for mounting said Hall generator on said carrier;

a direct current source connected to said Hall generator for energizing same;



an amplifier and discriminator circuit connected to said Hall generator and responsive to an output thereof representing a magnetic field around said carrier;

a display connected to said amplifier and discriminator circuit for displaying the current in said carrier; and

means for automatically connecting said source upon the mounting of said Hall generator on said carrier.

4,394,620

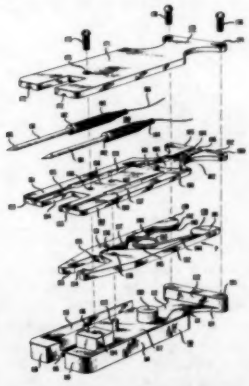
ELECTRICAL ACCESS TOOL FOR ENGAGING RECESSED TEST POINTS

Anthony R. Montalto, Edison; Louis J. Scerbo, Succasunna, and Jeremia P. Starace, Randolph Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 78,960, Sep. 26, 1979, Pat. No. 4,298,239. This application May 7, 1981, Ser. No. 261,662

Int. Cl.³ G01R *1/067*; H01R *13/00, 13/516*

U.S. Cl. 324—149 **4 Claims**



1. A test tool for accessing test points in a field having a protuberance serving to interlock said tool with said field, said tool

characterized by

a layered body comprising a bottom plate, an alignment plate and a cover plate, each said plate formed with correspondingly aligned recesses in their front edges to define a notch in said body, said alignment plate having laterally disposed lower channels formed in its top surface and straddling said notch, said cover plate having upper channels formed in its bottom surface in mirror-image relation to said lower channels,

electrically conductive spring-loaded pins interposed between said alignment plate and said cover plate and located in cooperatively mating ones of said upper and lower channels, each of said pins having a movable end projecting beyond said body and a spring end fixed in said body, and

means for holding said body and said test field in juxtaposed relation to enable each said movable end to contact one of said test points, said means for holding interposed between said bottom plate and said alignment plate and including: rotatable first and second fingers, each having a hooked end disposed within said notch and arranged to cooperatively grasp said protuberance; and a spring adapted to exert rotational force proximate the back ends of said fingers to cause each said hooked end to engage said protuberance.

4,394,621

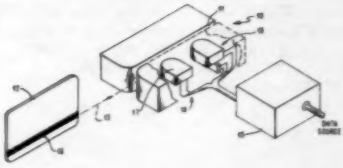
ELECTRONIC VELOCITY MEASUREMENT ESPECIALLY FOR SELF-CLOCKING WRITE HEAD

James E. Roben, Mint Hill, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1980, Ser. No. 214,319

Int. Cl.³ G01P *3/46, 3/52*

U.S. Cl. 324—163 **2 Claims**



1. Velocity measuring apparatus for producing an electrical measurement of the velocity of an object having at least one magnetically sensible mark thereon, wherein the improvement comprises:

an induced current magnetic field sensing device,

a variable resistance magnetic field sensing device,

means supporting said devices closely adjacent, one to another, for encountering said mark during substantially the same state of relative motion with respect to said object, and

means responsive to a signal output from each of said devices for producing said electrical measurement.

4,394,622

HIGH VOLTAGE COAXIAL SWITCH

John P. Rink, Los Alamos, N. Mex. (granted to U.S. Department of Energy under the provisions of 42 U.S.C. 2182)

Filed Jan. 3, 1981, Ser. No. 269,457

Int. Cl.³ H01J *17/00, 25/34*

U.S. Cl. 377—115 **12 Claims**

1. A high voltage coaxial switch comprising:

a circular cross-sectioned cylindrical cathode;

a thin walled hollow circular cross-sectional cylindrical inner electrode coaxially surrounding said cathode;

a hollow circular cross-sectional cylindrical outer electrode coaxially surrounding said inner electrode;

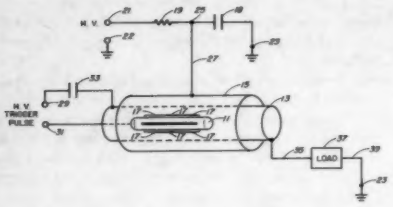
means for facilitating evacuation of the region between said cathode and said inner electrode;

means for facilitating provision of a gas to the region between said inner electrode and said outer electrode;

means for providing a high voltage charge to said outer electrode;

means for connecting a load to said inner electrode; and

means for providing a high voltage pulse between said cathode and said inner electrode to cause electrons to be emitted from said cathode and accelerated toward said inner electrode with sufficient quantities of electrons passing therethrough to cause secondary electron emission and a volumetric discharge in the region between said inner electrode and said outer electrode whereby a high voltage charge on said outer electrode is discharged to said inner electrode and through a load connected thereto.

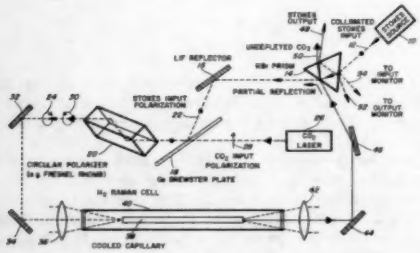


4,394,623

RING CAVITY FOR A RAMAN CAPILLARY WAVEGUIDE AMPLIFIER

Norman A. Kurnit, Santa Fe, N. Mex. (granted to U.S. Department of Energy under the provisions of 42 U.S.C. 2182)

Filed Jan. 27, 1981, Ser. No. 229,023
Int. Cl.³ H01S 3/30
U.S. Cl. 330—4.3 **12 Claims**



1. A ring cavity for a Stokes injected Raman capillary waveguide amplifier system comprising:

Raman capillary waveguide amplifier means for Raman scattering CO_2 laser radiation by rotational states of a diatomic molecular gas;

external Stokes radiation source means aligned for injecting an external Stokes signal into said Raman capillary waveguide amplifier means such that said external Stokes signal coprogpagtes with said CO_2 laser radiation and whereby said external Stokes signal reduces the gain required in said Raman capillary waveguide amplifier to generate an amplified Stokes signal;

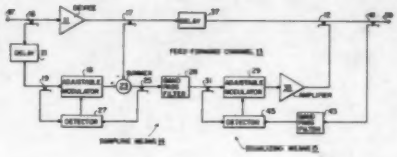
means for injecting a portion of said amplified Stokes signal back into said Raman capillary waveguide amplifier means in the same direction as said external Stokes signal to extend the effective duration of said external Stokes signal and to extract additional energy from said CO_2 laser radiation.

4,394,624

CHANNELIZED FEED-FORWARD SYSTEM

Ronald M. Bauman, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 7, 1981, Ser. No. 290,760
Int. Cl.³ H03F 1/26
U.S. Cl. 330—151 **23 Claims**



1. A feed-forward system for reducing the distortion generated by a device such as an amplifier, the feed-forward system comprising:

a feed-forward channel including,

sampling means adapted to be connected to the device for extracting a sample of the distortion products from the output of the device in a frequency band whose bandwidth is less than that of the device; and

equalizing means connected to the sampling means for equalizing the sample and the products remaining in the output of the device in the frequency band after extracting the sample; and

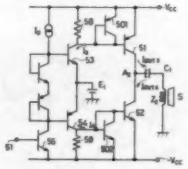
combining means connected to the equalizing means and adapted to be connected to the device for subtractively combining the equalized sample and the remaining products to produce a system output in which distortion in the frequency band is reduced.

4,394,625

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Koichi Sakai, Tokyo, Japan, assignor to Toko, Inc., Tokyo, Japan

Continuation of Ser. No. 96,429, Nov. 21, 1979. This application Dec. 21, 1981, Ser. No. 332,854
Claims priority, application Japan, Dec. 6, 1978, 53/151231; Mar. 28, 1979, 54/40157
Int. Cl.³ H03F 3/30
U.S. Cl. 330—267 **16 Claims**

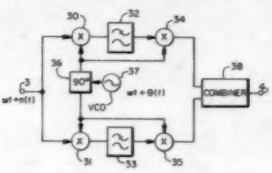


1. A semiconductor integrated circuit device comprising a power amplifier circuit including a vertical type PNP transistor and a first NPN transistor which are formed in a common semiconductor substrate, the output stage of said power amplifier circuit comprising a complementary symmetrical circuit wherein an output terminal is led out of the connection point between the collector of said vertical type PNP transistor and the collector of said first NPN transistor, a d.c. power source is connected between said emitter of said vertical type PNP transistor and the emitter of said first NPN transistor, and wherein at least one of the transistors constituting said complementary symmetrical circuit forms a current mirror circuit together with an additional transistor.

4,394,626
PHASE SYNCHRONIZING CIRCUIT

Hiroshi Kurihara, Tokyo; Sadao Takenaka, Yokohama, and Eiji Itaya, Kamakura, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 1, 1980, Ser. No. 211,847
Claims priority, application Japan, Nov. 29, 1979, 54-154554
Int. Cl.³ H03L 7/08
U.S. Cl. 331—12 14 Claims



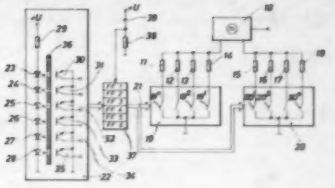
1. A phase synchronizing circuit comprising:
an input terminal;
a voltage-controlled oscillator (VCO) having an output and an input;
first and second phase detectors, each operatively connected to said input terminal and to said output of said VCO;
first and second low-pass filters, each of said filters having an input connected to a corresponding one of said first and second phase detectors, and an output, said first low-pass filter operatively connected to said input of said VCO, whereby the output of said first low-pass filter is applied to control the frequency of said VCO;
first and second multipliers, respectively, operatively connected to said first and second low-pass filters, each of said multipliers also being operatively connected to said output of said VCO;
adder means, operatively connected to said first and second multipliers, for providing an output signal of a linear combination of the outputs of said respective multipliers;
an output terminal, connected to receive said output signal of said adder means; and
at least one three-terminal phase shifting means, operatively connected between said first and second phase detectors and said VCO, and between said first and second multipliers and said VCO, in such relation that said first and second phase detectors operate in an orthogonal relation with respect to the input signal received at said input terminal, and in such relation that said output signal of said adder means is synchronous with the signal received at said input terminal.

4,394,627
AUDIOMETER WITH PHOTO SENSITIVE, DIGITALLY TUNABLE LOW DISTORTION OSCILLATOR

Gerd-Wolfgang Götze, and Manfred Müller, both of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 23, 1981, Ser. No. 237,107
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011651
Int. Cl.³ H03B 5/20
U.S. Cl. 331—66 8 Claims

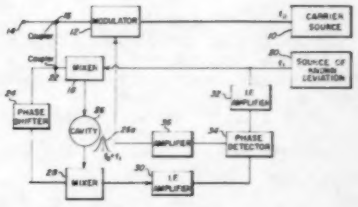
1. Audiometer having a low distortion, reproducible tunable oscillator including
an oscillator circuit (10);
a plurality of resistors (11–14; 15–18) in the oscillator circuit;
a like plurality of electronic switches (19^1, 19^2 . . . 19^n; 20^1, 20^2 . . . 20^n), one, each, connected in series with the respective resistor,
the connection pattern of the switches determining the operating frequency of the oscillator circuit;
and an opto-electronic switch control means providing binary digital output signals to said switches to control selective closing thereof and hence placing selected resistors in the oscillator circuit,
wherein the opto-electronic control means comprises a source of light (23–28);
a plurality of light responsive elements (30–35);
and a movable selective light transmission-blocking masking means having selective openings permitting light transmission between said light source and the light responsive elements, selectively, in accordance with the positioning of said openings and the blocking means with respect to the light responsive elements, to determine the tuning frequency of the oscillator in accordance with the position of the masking means, and for shifting the tuning frequency upon shifting of the masking means, free from switching clicks.



4,394,628
MODULATION SYSTEMS

Donald S. Banks, Wellesley Hill, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 2, 1962, Ser. No. 172,054
Int. Cl.³ H03C 7/00
U.S. Cl. 332—19 5 Claims



1. Apparatus for deviating the frequency of a carrier signal in accordance with the frequency deviations of an intermediate frequency signal comprising:
modulator means for varying the frequency of said carrier signal is accordance with a modulating signal;
first mixer means for providing sum and difference frequency signals of the product of the modulated carrier signal and the frequency deviating intermediate frequency signal;
filter means coupled to said mixer means and resonant at a predetermined one of said sum and difference frequency signals for providing a carrier control signal having a phase error component proportional to the deviation of said predetermined one of said sum and difference signals from its predetermined value;
second mixer means for mixing said carrier control signal with said modulated carrier signal to produce an intermediate frequency control signal having a phase error component proportional to the deviation of said predetermined one of said sum and difference signals from its predetermined value; and
means for comparing said intermediate frequency control

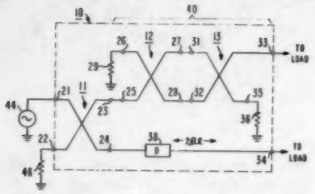
signal with said frequency deviating intermediate frequency signal to provide said modulating signal.

4,394,629

HYBRID POWER DIVIDER/COMBINER CIRCUIT

Mahesh Kumar, South Brunswick; Raymond J. Menna, Plainsboro, and Ho-Chung Huang, West Windsor, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1981, Ser. No. 249,609
Int. Cl.³ H01P 5/18
U.S. Cl. 333—109 **6 Claims**



1. A power divider comprising in combination:

first, second and third quadrature hybrids, each having a pair of input ports and a pair of output ports, one of said output ports of said first hybrid being connected to one of said input ports of said second hybrid, said output ports of said second hybrid being directly connected to the input ports of said third hybrid for causing a signal passing through the combination of said second and third hybrids to exhibit a propagation delay L and a fixed relative to frequency 90° phase shift; and

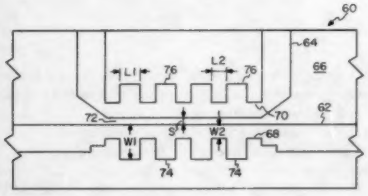
a transmission line exhibiting a propagation delay L having no fixed relative to frequency phase shift coupled to the other output port of said first hybrid.

4,394,630

COMPENSATED DIRECTIONAL COUPLER

Kenyon, S. Wayne, Manlius; Bernard H. Geyer, Jr., Liverpool, and Conrad E. Nelson, Camillus, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,519
Int. Cl.³ H01P 5/18
U.S. Cl. 333—116 **21 Claims**



1. A directional coupler comprising:

a dielectric substrate having two major parallel opposing faces;

a pair of spaced elongate electrodes disposed on one major face of said substrate and defining a coupling region therebetween extending along at least a part of their respective lengths; each of said electrodes comprising a comb electrode comprising an elongate bus bar extending in a generally longitudinal direction and a plurality of spaced teeth attached to said bus bar in the area of said coupling region and extending generally transverse to said bus bar in the direction away from the other of said electrodes; and

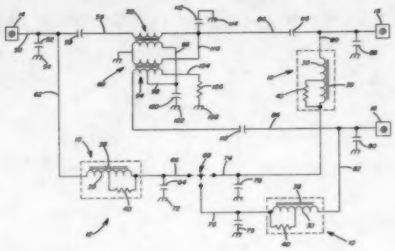
a conductor supporting said substrate.

4,394,631

RADIO FREQUENCY CHOKE AND METHOD OF USE

John C. Pavlic, Pleasant Gap, Pa., assignor to C-Cor Electronics, Inc., State College, Pa.

Filed May 29, 1981, Ser. No. 268,361
Int. Cl.³ H03H 7/46, 7/09
U.S. Cl. 333—132 **14 Claims**



11. A signal distribution passive unit comprising,

an input terminal for receiving an input signal including a radio frequency input signal and an AC power input signal,

a first output terminal and a second output terminal for transmitting a first output signal and a second output signal, said first and second output signals being matched to said input signal,

transformer means for receiving said radio frequency input signal to direct said radio frequency input signal to said first and second output terminals,

said transformer means being connected to said input terminal and said first and second output terminals,

choke means for separating said radio frequency input signal from said AC power input signal to prevent said AC power input signal from being transmitted to said transformer means,

said choke means being connected to said input terminal and to said first and second output terminals to by-pass said transformer means, and

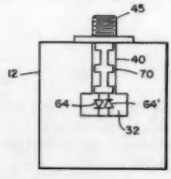
said choke means including an inductor coil having a resistor connected in series with said coil to present a high impedance to the inductance of said coil and reduce the series resonance in the coil and thereby prevent reductions in the magnitude of said AC power input signal for a broadband of radio frequencies.

4,394,632

MILLIMETER-WAVE ODD HARMONIC FREQUENCY MULTIPLIER

Chi P. Hu, Santa Barbara, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 29, 1981, Ser. No. 278,815
Int. Cl.³ H01P 1/20
U.S. Cl. 333—218 **12 Claims**



1. A millimeter-wave odd-harmonic frequency multiplier comprising:

(a) a block member of metallic material, said member having a main surface and a top surface at an angle to said main surface,

(b) a wave-guide RF output port extending from said main surface part way through said member, said port having a rectangular cross-section of constant width and with a first portion of said port adjacent to said main surfaces having a height selected in accordance with the desired frequency output of said multiplier and the remainder of said port having a height substantially reduced from that of said first portion,

(c) an RF input port extending from said top surface through said block member to connect with said remainder of said wave-guide port,

(d) low pass filter means insulatively positioned in said input port, and

(e) a pair of anti-parallel diodes positioned at the junction of said remainder of said wave-guide output port and said RF input port,

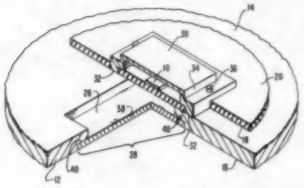
whereby said multiplier functions, upon a millimeter-wave signal of a base frequency being applied to said RF input port, to produce an output signal at said RF output port of an odd-harmonic of said base frequency.

4,394,633

MICROSTRIP CIRCUIT WITH SUSPENDED SUBSTRATE STRIPLINE REGIONS EMBEDDED THEREIN

Gerald I. Klein, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1981, Ser. No. 258,349
Int. Cl.³ H01P 3/08
U.S. Cl. 333—238 **11 Claims**



1. A microstrip microwave circuit having embedded therein at least one suspended substrate stripline region for high Q circuit elements, said microwave circuit comprising:

a ground plane having top and bottom surfaces;

a dielectric layer disposed on said top surface of said ground plane;

a continuous microstrip circuit pattern disposed on the exposed surface of said dielectric layer and having at least one region for high Q circuit elements with at least one interconnecting circuit path to the remaining microstrip circuitry, said dielectric layer having channels through to the top surface of said ground plane substantially encircling said microstrip circuitry of each corresponding high Q region except for portions of the dielectric layer which support said interconnecting microstrip circuit paths thereof;

said ground plane having the section substantially underneath each high Q region removed to form openings in the bottom surface thereof;

a metallic housing for each high Q region to form an upper ground plane covering the corresponding microstrip circuitry and separated therefrom by an air pocket, each housing having sidewalls adapted for seating into the dielectric channels of its high Q region to make physical contact with the top surface of said ground plane, said sidewalls of each housing including an opening for each interconnecting microstrip circuit path for passage therethrough; and

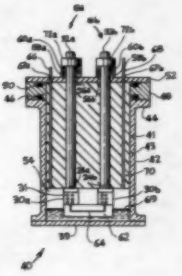
a metallic cover for said openings in the bottom surface of said ground plane to form a lower ground plane for each high Q region, said cover being separated from the microstrip circuitry of each high Q region by said dielectric layer and an air pocket.

4,394,634

VAPOR COOLED CURRENT LEAD FOR CRYOGENIC ELECTRICAL EQUIPMENT

James H. Vansant, Tracy, Calif. (granted to U.S. Department of Energy under the provisions of 42 U.S.C. 2182)

Filed Oct. 26, 1981, Ser. No. 314,918
Int. Cl.³ H01F 7/22
U.S. Cl. 335—216 **17 Claims**



1. Apparatus for conducting electric current to and from cryogenic electrical equipment, which comprises:

(a) a plurality of inner tubes, each having an inside end and outside end, provided with internal conduits substantially traversing the length of said tubes and penetrating said inside and outside ends, said inner tubes being arranged generally parallel to one another in substantially adjacent relation and capable of conducting and transferring electric current and heat;

(b) a plurality of outer tubes substantially encasing said inner tubes, said outer tubes having inside ends and outside ends defining openings in themselves, said outer tubes being capable of conducting and transferring electric current and heat, and being in heat conducting and electricity conducting communication with said inner tubes, said inner tubes and other tubes together forming a plurality of composite tubes;

(c) a sheath provided with an inside and outside end, defining a channel through itself which penetrates said inside and outside ends, said sheath being mounted to encase said plurality of composite tubes in a bundled arrangement forming apparatus capable of conducting and transferring electric current and heat;

(d) top and bottom block mounting means fitted to hold said composite tubes, said mounting means being fixedly held on said ends of said sheath in such relation that the combination of the sheath and mounting means define a chamber capable of sealably holding said composite tubes, said mounting means adapted to receive, conduct and transfer electricity and heat, said sheath, mounting means and composite tubes being combined for creating an electric current lead;

(e) vent means, located toward said outside end of said sheath, penetrating said sheath;

(f) cryogenic electrical equipment device, capable of being operated by electric current;

(g) cryogenic cooling means, housed within and cooling said device; and,

(h) means for connecting the inside end of said current lead to said device, so said internal conduits of said composite tubes are in fluid communication with said cooling means so said cooling means is free to move from the inside of

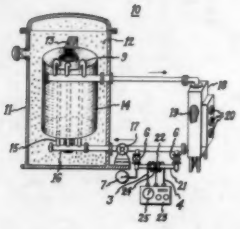
said device through said internal conduits of said composite tubes toward said outside end, emerging through said vent means and said outside ends of said composite tubes, cooling said composite tubes and said current lead as the cooling means travels from said inside end toward said outside end and vent means.

4,394,635

METHOD FOR DETERMINING DISSOLVED GAS CONCENTRATIONS IN DIELECTRIC COOLANTS

Stephen D. Foss, Pittsfield, Mass., assignor to General Electric Company, New York, N.Y.

Filed Apr. 16, 1981, Ser. No. 254,902
Int. Cl.³ H01F *27/08*
U.S. Cl. 336—55 **12 Claims**



2. A gas-insulated transformer comprising:
a transformer tank containing a noncondensable gas for use as a dielectric insulating medium;
a plurality of transformer windings arranged around a transformer core within said tank;
a plurality of tubes extending through said windings and containing a liquid coolant for cooling said winding during transformer operation;
piping means connecting with said coolant tubes and with a heat exchanger for carrying said coolant to said heat exchanger and removing heat from said coolant;
a sight glass connected with said piping means for observing a sample of said coolant within said piping means;
a pressure indicating means connected with said piping means for determining said coolant pressure;
heater means in thermal contact with said sight glass for heating said coolant to cavitation within said sight glass; and
temperature indicating means thermally proximate said sight glass for indicating the temperature of coolant within said sight glass.

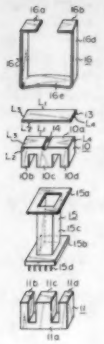
4,394,636

STRUCTURE OF A TRANSFORMER

Imaizumi Hiraku, Shisui, and Mitsui Tadashi, Tokyo, both of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 1, 1981, Ser. No. 259,704
Claims priority, application Japan, May 8, 1980, 55-63047[U]
Int. Cl.³ H01F *27/26, 27/30*
U.S. Cl. 336—172 **4 Claims**

1. A transformer comprising two E-shaped core parts, each having a back from one side of which projects at right angles thereto three spaced-apart legs, positioned with the extremities of the legs abutting such as to define a center leg and a leg at either side thereof between the backs of the E-shaped core parts, a spool on which is wound a coil positioned on the center leg and an I-shaped core part of a length and breadth corresponding to the length and breadth of the backs of the E-shaped core parts positioned in engagement with the back of one of the E-shaped core parts, means defining an open groove at the interfaces exclusively in one of said interfaces, a coil wound on the I-shaped core part, the windings of which are received in said groove and a C-shaped, elastically-engageable clamp means encompassing the core parts and clamping the E-shaped core parts in engagement with each other and the



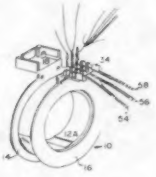
I-shaped core part in engagement with the back of said one of the E-shaped core parts.

4,394,637

WOUND BOBBIN COIL APPARATUS

Jose O. G. Petroons, Beersel, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 10, 1981, Ser. No. 282,194
Int. Cl.³ H01F *15/10*
U.S. Cl. 336—192 **5 Claims**



1. A wound bobbin coil apparatus which comprises·
a coil form having a generally cylindrical surface having disposed at respective axial extremeties thereof first and second generally circular side flanges;
said coil form including first and second generally L-shaped cooperating locking members extending respectively from said first and second generally circular side flanges, said locking members including means for locking engagement therebetween and including means for engaging a plurality of associated wires, said L-shaped locking members having at least one face thereof having a plurality of upstanding bosses disposed thereon in spaced relationship to allow entrance of termination wires therebetween.

4,394,638

MINIATURE PLUG-IN FUSE ASSEMBLY AND METHOD OF MAKING A FUSE ELEMENT THEREFOR

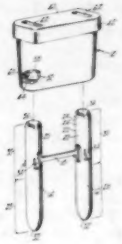
Sucha S. Sian, Southfield, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Jul. 21, 1982, Ser. No. 400,569
Int. Cl.³ H01H *85/22*
U.S. Cl. 337—264 **8 Claims**

1. A plug-in fuse assembly of the type comprising a housing formed of insulation material and a one-piece composite fuse element formed of fuse sheet metal and secured to said housing, said fuse element having two laterally spaced generally

parallel conductive terminal prong portions and a fuse link portion of substantially smaller cross sectional area than said terminal prong portions extending transversely between said terminal prong portions, said fuse assembly being characterised in that:

each of said terminal prong portions comprises a tubular body having an annular wall with contiguous edges thereof defining a longitudinally extending seam, each of



said tubular bodies having a forward contacting section adapted for insertion into a conductive receptacle contact and an integral retention section rearward of said contacting section, said terminal prong portions being formed with said seams in a generally coplanar relation and facing each other, said fuse link portion extending laterally from said retention sections proximate respective seams thereof; said retention sections and said fuse link portion being secured within said housing.

4,394,639

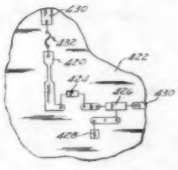
PRINTED CIRCUIT FUSE ASSEMBLY

James D. McGalliard, 11171 Fenwick Pl., Santa Ana, Calif. 92705

Division of Ser. No. 970,632, Dec. 18, 1978, Pat. No. 4,296,398. This application May 28, 1981, Ser. No. 267,704

Int. Cl.³ H01H *85/04*

U.S. Cl. 337—292 **4 Claims**



1. In an electrical device having a printed circuit board including a plurality of electrical components, such as a resistor, capacitor, integrated circuit, or the like, which are combined to form a printed circuit, an improved fuse assembly comprising:

a conventional fuse having a predetermined current rating electrically connected to said printed circuit;

a thin printed fuse element having a predetermined fuse rating higher than said rating of said conventional fuse formed integral with said printed circuit and connected in series with said conventional fuse; and

said thin fuse element, upon burn-out, providing a permanent record on said circuit board of consumer mis-use of said electrical device caused by the bypass or improper replacement of said conventional fuse.

4,394,640

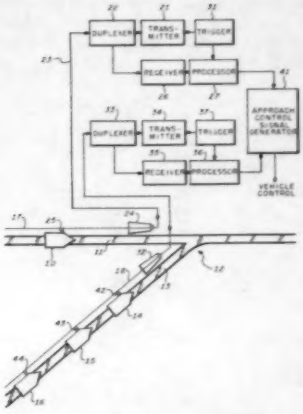
SAFE MERGING SYSTEM USING SHORT PULSE SIGNAL REFLECTOMERTY

Gerald F. Ross, Lexington, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Feb. 20, 1981, Ser. No. 236,504

Int. Cl.³ G08G *1/12*

U.S. Cl. 340—23 **8 Claims**



1. A system for determining distance to and speed of vehicles travelling in each of a multiplicity of merging guideways comprising:

means paralleling each of said merging guideways for the propagation of short electromagnetic pulses;

means coupled to said propagation means at a fixed preselected location for generating first electromagnetic pulses of short duration;

means on board each of said vehicles responsive to said first electromagnetic pulses for coupling second electromagnetic pulses of short duration to said propagation means for transmission towards said fixed location;

means coupled to said propagation means substantially at said preselected location for receiving said second electromagnetic pulses and for providing signals representative thereof; and

means coupled to receive said representative signals for determining distances from said fixed location to and speed of a preselected number of said vehicles.

4,394,641

METHOD AND DEVICE FOR CODING BINARY DATA AND A DEVICE DECODING CODED DATA

Max Artigalas, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 1, 1980, Ser. No. 192,940

Claims priority, application France, Oct. 1, 1979, 79 24419

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD **5 Claims**

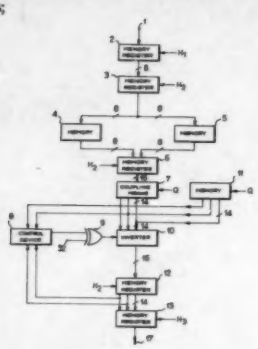
1. A device for preparing an input signal for transmission, said input signal having a sequence of groups selected from a set of all possible groups, each of said groups having n binary digits having a repetition frequency of F, comprising:

a parallel-read series-write memory register having one input for receiving the input signal and n outputs for delivering simultaneously the n bits of each group;

first memory means having n address inputs coupled respectively to the n outputs of said memory register and 2n outputs for delivering respectively, one word of an associated pair of a plurality of pairs of words, each of said pairs being uniquely associated with one possible output of said

memory register, respectively, each of said words having n bits of a "0" state and n bits of a "1" state and a repetition frequency of 2F, each of the bits of said words being adjacent to a bit having the same state except end bits of said words which can be adjacent to a bit in said word of opposite state, one word of each of said pairs being a complement of the other word of each of said pairs;

a first parallel-read/write memory register means having 2n inputs coupled to the outputs of said first memory means for storing the value of the word delivered by said first memory means, said first memory register means having 2n outputs;



an inverter having 2n inputs coupled respectively to the 2n outputs of said first memory register means, a control input for receiving a control signal, and 2n outputs;

a second parallel-read/write memory register means having 2n inputs coupled respectively to the 2n outputs of said inverter and 2n outputs;

a control device having one output for delivering said control signal for said inverter as a function of both the binary word defined by the 2n bits present on the 2n inputs of the inverter and the binary word defined by the 2n bits present on the 2n outputs of said inverter; and

a series-read parallel-write memory register having 2n inputs coupled respectively to the 2n outputs of said second memory register means and one output.

4,394,642

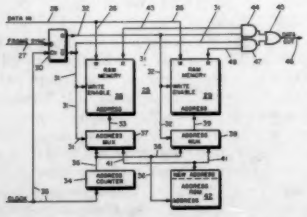
APPARATUS FOR INTERLEAVING AND DE-INTERLEAVING DATA

Robert J. Currie; Glen D. Rattlingourd, both of Salt Lake City; Billie M. Spencer, Bountiful, and John W. Zscheile, Jr., Farmington, all of Utah, assignors to Sperry Corporation, New York, N.Y.

Filed Sep. 21, 1981, Ser. No. 304,434

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD **11 Claims**



1. A data transmitting system of the type having an interleaver for changing the order of data bits in a data stream to be transmitted comprising:

a data source for providing a stream of data bits to be transmitted,

interleaver means coupled to said stream of data bits,

transmitter means coupled to said interleaver means for transmitting said data bits in a quasi-random pattern sequence,

said interleaver means comprising buffer memory means for storing a block of said stream of said data bits in a predetermined sequential pattern of memory addresses,

said addresses being definable in terms of an array of columns and rows,

first address pointer means coupled to said buffer memory means for generating said predetermined pattern of memory addresses and for storing said data bits in said buffer memory means in rows,

second address pointer means coupled to said buffer memory means for generating a predetermined quasi-random pattern of memory addresses and for reading said stored data bits out of said buffer memory means by columns,

said predetermined quasi-random pattern of memory addresses being generated by a predetermined rotation of bits within columns, and

control means coupled to said buffer memory means and said first and second pointer means for alternately storing said stream of data bits into said buffer memory means as rows of data bits and for reading said stored data bits out of said buffer memory means as columns of data bits in a predetermined quasi-random stream of data bits.

4,394,643

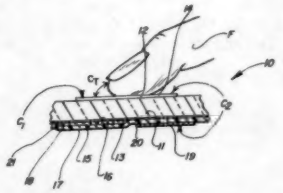
CAPACITIVE TOUCH PANEL CONTROL

Robert R. Williams, Green Camp Township, Marion County, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 29, 1981, Ser. No. 258,589

Int. Cl.³ G06F *3/02*; H01G *7/00*

U.S. Cl. 340—365 C **15 Claims**



1. A capacitive touch panel comprising:

a first dielectric wall member having opposite first and second surfaces;

a conductive touch pad on said first surface;

a second dielectric wall member having opposite third and fourth surfaces;

a first conductive circuit pad on said third surface;

a second conductive circuit pad on said fourth surface, said second circuit pad being out of appositional facial registration with said first circuit pad;

electrical means connecting said first and second conductive circuit pads in an electrical circuit, said electrical connecting means including one portion adjacent said third surface and another portion adjacent said fourth surface, the disposition of said portions adjacent said opposite surfaces of the second dielectric wall member permitting crossover of said portions with the crossover portions being spaced apart by said second dielectric wall member; and

means for retaining said dielectric wall members with said third surface facially juxtaposed to said second surface and with at least a portion of each of said circuit pads in

appositional facial registration with said touch pad to provide a variable capacitance between said circuit pads as an incident of selective touching and nontouching of said touch pad by a user.

4,394,644

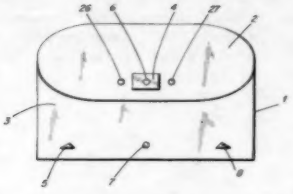
PURSE ALARM

Angela M. Di Leo, Linden, and James Lucia, Morristown, both of N.J., assignors to Solomon Zaromb, Hinsdale, Ill.

Continuation-in-part of Ser. No. 56,811, Jul. 12, 1979, abandoned. This application Oct. 17, 1980, Ser. No. 198,120

Int. Cl.³ G08B *13/14*

U.S. Cl. 340—571 **17 Claims**



1. In a battery-powered alarm device comprising a switch connecting a battery to an alarm so as to activate the latter, said battery, alarm, and switch being enclosed within a purse, satchel or any other type of bag, the improvement comprising a switch means for keeping said alarm from being activated and for deactivating said alarm once it has been activated by opening said switch and keeping said switch open through the insertion of a prong uniquely shaped into a matching hole within said purse, satchel or other bag and for activating said alarm upon withdrawal of said prong, said prong being insertible and withdrawable externally to said bag, and said switch means being recessed and substantially concealed within said matching hole in such a manner that mere insertion therein of or poking with a sharp-tipped object other than said uniquely shaped prong can not bring about the opening of said switch to deactivate said alarm.

4,394,645

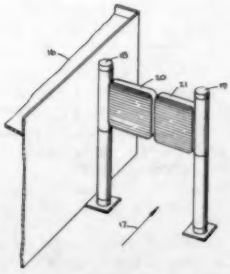
ELECTRICAL SURVEILLANCE APPARATUS WITH MOVEABLE ANTENNA ELEMENTS

David R. Humble, Deerfield Beach; Jon N. Weaver, Boca Raton; David L. Gentzler, Boynton Beach; Ezra D. Eskandry, Pompano Beach, and Peter J. Lamanna, Boca Raton, all of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Continuation-in-part of Ser. No. 301,038, Sep. 10, 1981, abandoned. This application Jan. 8, 1982, Ser. No. 337,990

Int. Cl.³ G08B *18/00, 22/00*

U.S. Cl. 340—572 **20 Claims**



1. Apparatus for detecting the presence within a surveillance zone of an electrical energy responsive marker wherein a transmitter is coupled to an electrical energy field radiator for establishing throughout said zone an AC energy field, and a receiver is coupled to an electrical energy field receptor for detecting a predetermined alteration of said AC energy field caused by the presence of said marker within said AC energy field, characterized in that at least one of said radiator and receptor is disposed in a gate-like structure that is mounted for rotation to and fro about a vertical axis with substantially all of said structure extending horizontally to one side of said axis.

4,394,646

TEMPERATURE INDICATOR FOR A GLASS CERAMIC COOKING SURFACE

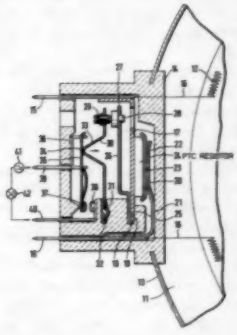
Gerhard Gössler, Mörikestr. 46, D-7519 Oberderdingen, Fed. Rep. of Germany

Filed Oct. 28, 1980, Ser. No. 201,563

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1979, 2943922

Int. Cl.³ H01H *37/46;* H05B *3/02*

U.S. Cl. 340—594 **8 Claims**



1. A temperature indicator for a glass ceramic cooking surface, the temperature indicator having an indicating device, a heat-sensitive switching device including an auxiliary heating system, a temperature sensor and a switch operable by the temperature sensor for activating the indicating device, the switching device, temperature sensor and switch being disposed in a casing that is thermally coupled to said cooking surface, the temperature indicator comprising:

two electrodes disposed in the casing, the auxiliary heating system being fixed therebetween by spring action, one of the electrodes forming a partition between the auxiliary heating system and the temperature sensor;

the auxiliary heating system including a positive temperature co-efficient (PTC) resistor having a Curie temperature below the ambient temperature of the casing during continuous operation of the heating system and having a maximum rated operating temperature above the continuous operating ambient temperature;

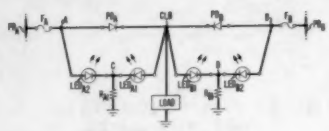
the switch for the indicating device being located away from the cooking surface for protection against thermal damage; and,

the temperature sensor being thermally coupled so closely to the heating system of the glass ceramic cooking surface and to the glass ceramic cooking surface itself that the cooling time of the temperature sensor coincides with the cooling time of the glass ceramic cooking surface, notwithstanding variations in the cooling time of the glass ceramic cooking surface as normally occur.

4,394,647
VOLTAGE MONITORING ARRANGEMENT FOR ORED POWER DIODES

Gilbert A. Van Dine, Winfield Township, Du Page County, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 14, 1981, Ser. No. 301,960
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—645 **20 Claims**



1. A voltage monitoring arrangement for a direct-current power distribution system wherein a plurality of separate power sources supply power in parallel to a common load through separate two-terminal power diodes similarly poled for unidirectional current conduction therethrough between the source terminals of the power diodes and the common load terminals of the power diodes and wherein the sources and the load have a common power supply return characterized in that at least one power diode is provided with voltage monitoring circuitry comprising:

(A) a first two-terminal current conducting circuit adapted to be fully conducting only in response to a prescribed first minimum amount of direct-current voltage across its terminals and to be negligibly conducting for lesser or reversed-polarity voltages;

(B) a second two-terminal current conducting circuit adapted to be fully conducting only in response to a prescribed second minimum amount of direct-current voltage across its terminals and negligibly conducting for lesser or reversed-polarity voltages; and

(C) a two-terminal, direct-current impedance;

(D) one terminal of each of the first circuit being connected to a common circuit node, the corresponding terminal of said second circuit being connected to the same common node; and one of said terminals of said impedance being connected to said common circuit node;

(E) the other terminals of the respective first circuit, second circuit, and impedance being connected respectively to the load terminal of the power diode, to the source terminal of the power diode, and to the common return; and,

(F) the impedance being of such value as to limit to prescribed maxima the fully conducting amounts of current through the first and second circuits.

4,394,648
BRUSH WEAR DETECTOR SYSTEM WITH LATCHING RELAY

Richard W. Mattson, Rossford, Ohio, assignor to Allied Corporation, Toledo, Ohio

Filed Jul. 13, 1981, Ser. No. 282,849
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—679 **5 Claims**

1. A brush wear detection system, comprising:

a dynamoelectric machine having a plurality of brushes;

at least one sensing wire means for providing a brush wear signal indicative of critical brush wear;

a latching relay operatively connected to said sensing wire means;

said latching relay including a set relay and a reset relay;

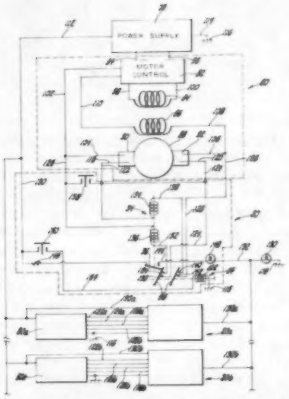
said set relay having a first frame, a first coil assembly responsive to said brush wear signal including a first core and at least one first winding, and a first movable armature, said first coil assembly having a first longitudinal axis and a first armature having a second longitudinal axis, said first axis being substantially perpendicular to said second axis;

said reset relay having a second frame, a second coil assembly including a second core and a second winding, and a second moveable armature;

said second coil assembly having a third longitudinal axis and said second armature having a fourth longitudinal axis, said third axis being substantially perpendicular to said fourth axis;

said set relay being disposed perpendicularly to said reset relay, said first axis being perpendicular to said third axis and said second axis being substantially perpendicular to said fourth axis;

said first axis intersecting said second axis, and said third axis intersecting said fourth axis, said second axis being substantially parallel to said third axis and said first axis being substantially parallel to said fourth axis, and said third axis being substantially spaced from said second axis;



said first armature having an energized position and a de-energized position responsive to said first coil assembly;

said second armature having an energized position and a de-energized position responsive to said second coil assembly;

said first armature substantially perpendicularly overlapping a portion of said second armature and latching said second armature in said energized position when said first armature is in said de-energized position;

said second armature substantially perpendicularly overlapping a portion of said first armature and latching said first armature in said energized position when said first armature has moved to said energized position responsive to said first coil assembly;

said set relay including a pair of alarm contacts operatively connected to a source of power and to an alarm means for providing an indication of brush wear responsive to said sensing wire.

4,394,649
COMMUNICATION TERMINAL PROVIDING USER COMMUNICATION OF HIGH COMPREHENSION

Michael A. Suchoff, Brookline; Holly T. Doyle, and Robert O. Doyle, both of Cambridge, all of Mass., assignors to I/O Corporation, Santa Monica, Calif.

Filed Jul. 28, 1980, Ser. No. 173,263
Int. Cl.³ G09G *3/04*
U.S. Cl. 340—711 **28 Claims**

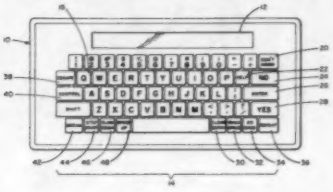
1. A keyboard and display terminal for communication with a data processing host and having character-entering keys and a character-displaying element and further having the improvement comprising

A. means for selectively controlling character display on a

single line of said display element to start the display of characters in either of first and second spaced-apart locations of said single display line,

B. means for restricting keyboard control of displayed characters to only those characters for which the display starts at said second display location,

C. means for extending, along said single display line, the display of characters for which the display started at said second location in the direction toward the display loca-



tions of characters for which the display started at said first location, and

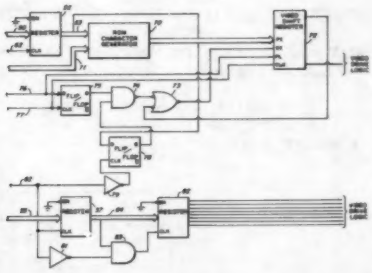
D. means responsive to the extension of characters for which the display started at said second location onto locations displaying characters for which the display started at said first location, for maintaining the display of the latter characters stationary in the absence of such an extension, and for moving the display of the latter characters in the direction of said extension in the presence of such an extension.

4,394,650

GRAPHIC AND DATA CHARACTER VIDEO DISPLAY SYSTEM

Nicholas R. Long, Hudson, N.H.; William E. Peisel, Marlboro, Mass.; Joseph L. Ryan, Tuscon, Ariz., and Richard R. Watkins, Chelmsford, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Feb. 19, 1981, Ser. No. 235,807
Int. Cl.³ G09G *1/14*
U.S. Cl. 340—728 **3 Claims**



1. A video control system for supplying both data characters and graphic characters to video drive logic controlling the operation of a CRT video screen in a video terminal system having a timing control system, said video control system comprising:

(a) logic memory means responsive to binary address codes for providing binary character codes including, alternatively, both binary data character codes and binary graphic character codes, the binary character codes comprising bits sufficient in number to match that required in a horizontal scan of a data character but not sufficient in number to match that required in a horizontal scan of at least certain graphic characters;

(b) video information stream logic means receiving said binary character codes from said logic memory means and responsive to clock control signals generated by said timing control system for converting said binary character codes to a serial video bit stream to be applied to said video drive logic, and repeating a most significant bit position logic level in said serial video bit stream upon occurrence of a graphic character flag bit in said binary address code.

4,394,651

EASTERN ARABIC NUMBER DISPLAY

Michael Frankston, 375 Harvard St., Apt. 23, Cambridge, Mass. 02139, and Krikor A. Bezjian, 24 Frederick St., Belmont, Mass. 02178

Filed Jun. 9, 1980, Ser. No. 157,895
Int. Cl.³ G09G *3/04*
U.S. Cl. 340—756 **16 Claims**

1. A multiple segment number display for selectively displaying each Eastern Arabic number, said display comprising eight segments, six of said segments being substantially elongated, said segments being oriented with respect to one another such that when viewing said display in its proper orientation,

(a) five of said elongated segments are arranged to form an apparent quadrilateral, the first and second of said five elongated segments forming the respective top and bottom of said quadrilateral, a third of said five elongated segments forming the right hand side of said quadrilateral, and the remaining fourth and fifth segments of said five elongated segments extending substantially colinearly with respect to one another, the fourth segment disposed above said fifth segment, so as to form the left hand side of said quadrilateral,

(b) the sixth elongated segment extends from the approximate top left corner of said quadrilateral to the approximate bottom right corner of said quadrilateral so as to form a diagonal of said quadrilateral dividing said quadrilateral into left and right triangular portions, and,

(c) the seventh and eighth segments are disposed respectively in the left and right triangular portions;

wherein said eight segments are selectively energizable so as to display each of said Eastern Arabic numbers.

4,394,652

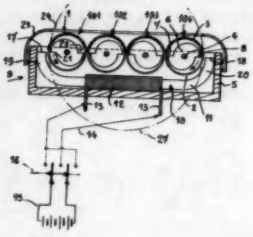
DATA DISPLAY SYSTEM

Jean Rabette, Bondues, France, assignor to Societe Vandeputte Fils & Cie, S.A., Tourcoing, France

Filed Jun. 3, 1981, Ser. No. 270,007
Claims priority, application France, Jul. 18, 1980, 80 16076
Int. Cl.³ G09G *3/34*
U.S. Cl. 340—764 **2 Claims**

1. Data display system having a group of at least two parallel rotors (101 to 104) each formed by a single body (2), having in two diametrically opposite areas ranges of different colors, which rotates freely in a mounting (5) to which it is associated by a shaft (4), which is in contrast interlocking in rotation with a permanent magnet (6) the position of which is such that the

line passing through its poles (7, 8) is essentially radial to the axis of the shaft (4), in which system end rotors (101, 104) of the group of at least two parallel rotors, to control their rotation, each cooperate with one pole of an electromagnet (10) connected to a source (15) of direct current by an inverter-interruptor (16) and which is attached to the mounting (5) in such a way that each pole is located in the plane perpendicular to the axis of the rotors in which the poles of the permanent magnets may turn, and in said system the datum to be displayed, such as a sign, a letter, a figure or a design, consist of at least one point the entire apparent surface of which is always



of one color, for example light, or of another, for example dark, this point is itself formed of several colored ranges which are juxtaposed and borne by distinct ones of the group of rotors (101, 102, 103, 104) grouped to be controlled synchronously and, so that all the rotors of the same group may be activated at the same time, the system includes a single electromagnet (10) having poles (17, 18) located in the plane of the axes of the rotors, on either side of the entire group of rotors so as to directly exert their effect only on the permanent magnets (6) of the rotors (101, 104) located at the ends of the group and only on their pole oriented towards the outside of the group.

4,394,653

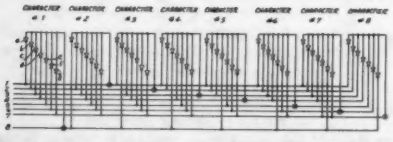
BI-DIRECTIONAL DRIVE MULTIPLEXED DISPLAY SYSTEM

Eric G. Breeze, Los Altos, Calif., assignor to General Instrument Corporation, New York, N.Y.

Filed Nov. 24, 1980, Ser. No. 210,133

Int. Cl.³ G09G *3/14*

U.S. Cl. 340—802 **15 Claims**



1. An apparatus comprising: a display having a plurality of characters, each of said characters having N segments, each of said segments being electrically unidirectional and having two terminals of different polarities said apparatus further consisting of; N+1 directly interconnected with said characters; each character having N of said N+1 busses connected to like polarity terminals of the N segments of that character, and the N+1th bus for that character being connected to all of the other polarity terminals of the segments of that character; and said N+1th bus being a different bus for each character.

4,394,654

IDENTIFICATION DEVICE

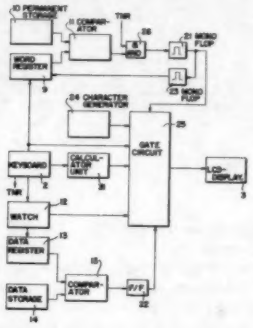
Hellmut W. Hofmann-Cerfontaine, Nuremberg, Fed. Rep. of Germany, assignor to Hannsheinz Porst, Nuremberg, Fed. Rep. of Germany

Filed Apr. 17, 1981, Ser. No. 255,192

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014882

Int. Cl.³ G06K *5/00*; G08B *13/06*; H04Q *1/00*

U.S. Cl. 340—825.34 **12 Claims**



1. An identification device characterized in that permanent storage means in which an alphanumerical character string forming a code is stored, and a word register into which an alphanumerical character string can be entered by means of input means, are connected to a comparator which supplies to a display device a control signal indicating that conformity between the two character strings is either present or missing; and further characterized by a time function element with interlocking means which, at the end of a pre-determined expiration period of time, supplies an interlocking signal which prevents an existing conformity from being displayed, the expiration period defining the validation during which the device permits indication of the presence or absence of conformity.

4,394,655

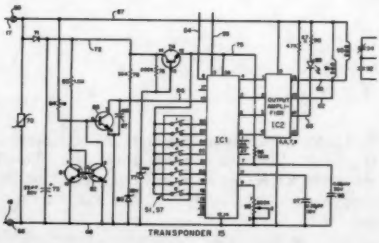
BIDIRECTIONAL, INTERACTIVE FIRE DETECTION SYSTEM

John M. Wynne, Oak Ridge, and William R. Vogt, Rockaway, both of N.J., assignors to Baker Industries, Inc., Parsippany, N.J.

Filed Mar. 13, 1981, Ser. No. 243,401

Int. Cl.³ H04Q *9/00*; G08B *23/00*

U.S. Cl. 340—825.36 **19 Claims**



1. A bidirectional, interactive signalling system comprising a pair of electrical conductors,

a controller coupled to said conductors, for transmitting a series of signal groups sequentially over said conductors,

each signal group comprising a plurality of pulse signals, each pulse signal having first and second portions of different amplitude; and

a plurality of transponders, each coupled to said conductors, each transponder having its own unique address, with each of said transponders being connected to recognize as its address a particular signal group in the series of signal groups transmitted from the controller, and to respond upon recognition of its unique address by transmitting data back to the controller over the same conductor pair, which data may include information regarding a predetermined condition such as alarm and/or trouble, in which said controller transmits one or more commands to a selected one of the transponders by modulating a first portion of at least one signal in the signal group directed to the selected transponder, and the selected transponder replies by modulating the second portion of at least one pulse signal in the same signal group to encode data selected for return to the controller.

4,394,656

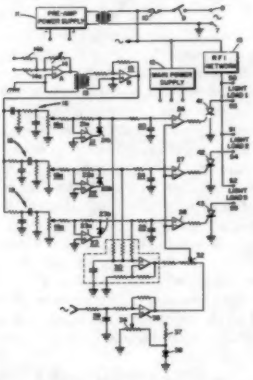
SOUND DISPLAY APPARATUS HAVING SEPARATION CONTROL

Mark T. Goettsche, 2310 McMillan, Eugene, Oreg. 97405

Filed Sep. 24, 1981, Ser. No. 305,293

Int. Cl.³ A63J *17/00*; H04Q *19/02*

U.S. Cl. 340—825.73 **12 Claims**



1. A light modulated sound display for producing lighting effects from first and second stereophonically related audio signals comprising:

(a) summation amplifier for combining said stereophonically related signals;

(b) first, second, and third filters for receiving an output signal from said summation amplifier, said filters dividing said signal into first, second and third signals, each containing a portion of the signal frequencies contained in said output signal;

(c) first, second and third comparators, each having an input connected to one of said first, second and third filters, and each having a reference input;

(d) means for combining a portion of the signal provided by said filters, said means providing a reference signal for each of said comparator's reference input; and

(e) first, second and third switching gates connected to drive individual lighting elements, said gates having a control input connected to one of said comparator output terminals, whereby said switching elements are individually controlled to illuminate a lighting element according to the signal energy provided by one of said filters.

4,394,657

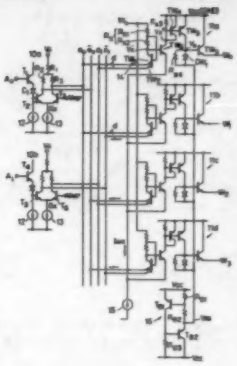
DECODER CIRCUIT

Hideaki Isogai, Higashikurume, and Yukio Takahashi, Shiga, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 18, 1980, Ser. No. 217,757

Int. Cl.³ H04Q *9/00*; H03K *19/086, 19/01*; G11C *11/40*

U.S. Cl. 340—825.93 **11 Claims**



1. A decoder circuit, operatively connectable to receive a plurality input signals "a_0, a_1, a_2, - - - , a_i" and to a word line, comprising:

input gates, operatively connectable to receive the plurality of input signals "a_0, a_1, a_2, - - - , a_i", for generating inverse signals "$\bar{a}_0$, $\bar{a}_1$, $\bar{a}_2$, - - - , $\bar{a}_i$" in dependence upon the plurality of input signals "a_0, a_1, a_2, - - - , a_i";

a logic circuit, operatively connected to said input gates, for generating an output in dependence upon combined input signals that are the combination signals of said signals a_0 through a_i and $\bar{a}_0$ through $\bar{a}_i$;

an output gate, operatively connected to said logic circuit and operatively connectable to the word line, for selectively driving the word line by the output supplied from said logic circuit; and

current control means, electrically connected between a voltage source and said output gate, for switching a current from said voltage source and activating said output gate.

4,394,658

ADAPTIVE MTI CLUTTER TRACKER-CANCELLER METHOD AND APPARATUS

Robert D. Short, III, Littleton, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 27, 1981, Ser. No. 248,617

Int. Cl.³ G01S *13/52*

U.S. Cl. 343—7.7 **11 Claims**

1. An adaptive MTI clutter canceller comprising:

mixer means having input means for receiving signals at first and second frequencies, said second frequency differing from said first frequency by a difference frequency, and output means for providing signals, at said output means, having frequencies representative of said difference frequency;

delay means having input means coupled to said output means of said mixer means for time delaying said signals at said difference frequencies and for providing said time delayed signals at an output means thereof;

phase comparator means having first input means coupled to said output means of said delay means and second input means coupled to said output means of said mixer means for providing signals at an output means that are representative of phase differences between signals coupled from

said output means of said time delay means and said output means of said mixer means;

first averaging means having input means coupled to said output means of said phase comparator means for providing signals representative of an average, over a first predetermined period, of signals coupled from said phase comparator means;

second averaging means coupled to receive said average signal from said first averaging means for providing signals representative of an average, over a second predetermined period, of signals coupled from said averaging means; and

means having output means coupled to said input means of said mixer means and input means coupled to receive said average signal from said second averaging means for providing signals having frequencies that are functions of said average signals coupled from said second averaging means.

4,394,659

MONOPULSE RADAR WITH PILOT SIGNAL GENERATOR

Bernard Gellekink, Ootmarsum, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

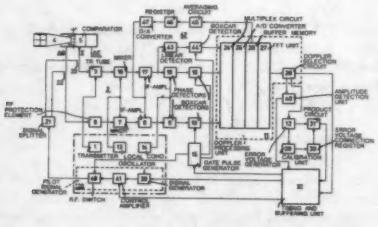
PCT No. PCT/NL80/00012, § 371 Date Dec. 17, 1980, § 102(e) Date Dec. 12, 1980, PCT Pub. No. WO80/02326, PCT Pub. Date Oct. 30, 1980

PCT Filed Apr. 8, 1980, Ser. No. 227,097

Claims priority, application Netherlands, Apr. 17, 1979, 7902974

Int. Cl.³ G01S *13/44*

U.S. Cl. 343—16 M **10 Claims**



1. A monopulse radar for tracking a target, comprising:

a. a tunable transmitting means for transmitting RF pulse signals toward the target;

b. a plurality of receiving channels for producing tracking error signals from target return signals;

c. a tunable pilot signal generator for injecting pilot signals representative of artifical target return signals into the receiving channels, said pilot signals having predefined phase and amplitude relationships;

d. means for correcting the tracking error signals in response to differences in the amplification and the phase shifts of the pilot signals injected into the individual receiving channels;

e. doppler frequency detecting means for detecting a target doppler frequency from the tracking error signals; and

f. a control circuit electrically-connected to the tunable pilot signal generator, to the tunable transmitting means, and to the doppler frequency detecting means for tuning the pilot signal frequency to the composite value of the transmitting frequency and the doppler frequency.

4,394,660

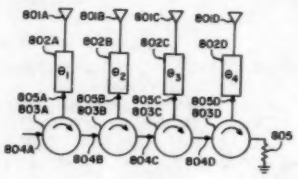
PHASED ARRAY FEED SYSTEM

Leonard D. Cohen, Brooklyn, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 18, 1980, Ser. No. 217,947

Int. Cl.³ H04B *7/00*

U.S. Cl. 343—100 SA **2 Claims**



1. A feed system for a phased array antenna, comprising:

(a) a plurality of injection lock oscillators, each having a first input port for accepting an injection lock signal, a second input port for accepting a signal to control the phase of the oscillator's output signal and an output port for supplying the oscillator output signal to an external load, said second input port being separate and unconnected to any bias port used to supply bias power to said oscillator,

(b) means for coupling each oscillator output port to an antenna element in a series of adjacent elements in a phased array antenna,

(c) a tuned circuit within each oscillator for tuning the frequency of the oscillator when the oscillator is not injection locked and for adjusting the phase of the output signal of the oscillator when the frequency of the oscillator is controlled by the injection lock signal, the tuned circuit being tuned by a control signal applied to the second input port of the oscillator,

(d) means for supplying an injection locked signal to the first input port of a first oscillator which supplies a first antenna element, and

(e) means for coupling a portion of the output signal of each oscillator to the first input port of the next oscillator which supplies the next adjacent element in the array, the coupled signal serving as the injection lock signal for the oscillator receiving the coupled signal.

4,394,661

RECORDING MATERIAL FOR STORAGE OF DIGITAL INFORMATION AND A RECORDING METHOD FOR STORAGE OF DIGITAL INFORMATION

Hugo K. Peeters, Mortsel, Belgium, assignor to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Mar. 25, 1981, Ser. No. 247,405

Claims priority, application United Kingdom, Apr. 22, 1980, 8013289

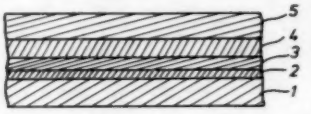
Int. Cl.³ G01D *15/34*

U.S. Cl. 346—1.1 **16 Claims**

11. Recording method operating with information-wise modulated laser beams comprising the steps of

(1) information-wise pulsed irradiation with a first laser beam of a recording material comprising on the same side of a laser

radiation-reflective support, including a support with laser radiation reflecting layer, two superimposed adjacent recording layers which can undergo on exposure instantly produced optical density changes responsive to irradiation with laser beams of different wavelength, the compositions of said layers being such that they have different radiation-sensitive characteristics permitting information-wise recording to take place in one layer without changing the optical density of the other layer to such a degree that laser beam read out of optical density information in one layer becomes impossible upon using laser beams of different wavelength for each recording layer, wherein said first beam is focused onto a thermosensitive recording layer of said recording material, while having a relative movement between said thermosensitive recording layer and said beam, the exposure with said first beam being of sufficient dose to produce in said thermosensitive recording layer a pattern of a physical change associated with a change in optical density, and



(2) information-wise pulsed laser irradiation of said recording material with a second laser beam which beam is focused onto a photosensitive recording layer of said recording material while having a relative movement between said photosensitive layer and said second laser beam whose laser radiation contains electromagnetic radiation of the visible and/or ultra-violet wavelength range in the spectral sensitivity range of the photosensitive layer, the exposure of the photosensitive recording layer being information-wise such that a detectable colour or colour change is formed therein without affecting the thermosensitive layer, the recording of information with the first laser beam in the thermosensitive recording layer being such that therein the optical density is modified without modifying the optical density of the photosensitive layer in such a degree that the selective laser beam read out of recorded information in each of the recording layers by using laser radiation of different wavelength becomes impossible.

4,394,662

DOT PRINTER FOR REPRODUCTION OF HALFTONE IMAGES

Kunio Yoshida; Hiroaki Kotera; Yukifumi Tsuda, all of Kawasaki; Yoshimitsu Kanno, Sagamihara, and Motohiko Naka, Kanagawa, all of Japan, assignors to Matsushita Research Institute Tokyo, Inc., Kanagawa, Japan

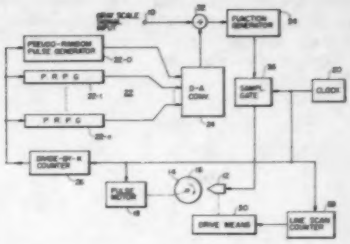
Filed Jul. 30, 1981, Ser. No. 288,513

Claims priority, application Japan, Jul. 31, 1980, 55-106081; Dec. 25, 1980, 55-188015

Int. Cl.³ G01D *9/00, 15/18;* **H04N** *1/22*

U.S. Cl. 346—33 R **21 Claims**

1. A dot printer adapted to receive a gray scale input signal comprising a recording head having a tendency to become inoperative in a range below a threshold level, means for controlling said recording means in response to a clock pulse to record on a recording medium a dot with varying proportions of high and low discrete levels as a function of said gray scale input signal, means for moving said recording head and recording medium relatively to each other so that the recording head scans along a line path and is successively shifted to the next scan line by the width of a line path, means for generating an oscillating signal, and means for modulating the amplitude of said gray scale input signal with said oscillating signal to overcome said tendency so that the modulated signal oscillates above and below the threshold level.



4,394,663

INK JET PRINTING APPARATUS

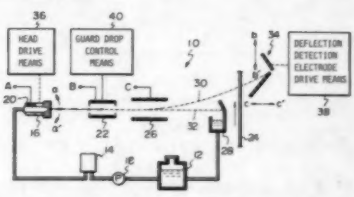
Minoru Ameyama, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 25, 1981, Ser. No. 305,427

Claims priority, application Japan, Oct. 4, 1980, 55-139211

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **5 Claims**



1. An ink jet printing apparatus including an ink jet head, vibrator means for applying pressure oscillation to ink in the ink jet head thereby causing the ink to be ejected from the ink jet head and separated into droplets, charging means for charging the ink droplets and deflection means for deflecting the charged ink droplets, characterized by comprising:

control means for controlling a size of images printed by the printing apparatus, the control means comprising coarse control means for adjustably moving at least one of the ink jet head, charging means and deflection means and fine control means for varying the number of guard drops composed of uncharged ink droplets between charged ink droplets.

4,394,664

THERMAL PLOTTER

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Jan. 29, 1982, Ser. No. 344,021

Int. Cl.³ G01D *15/10*

U.S. Cl. 346—76 R **10 Claims**

1. A thermal plotter comprising:

a pair of electrically conductive elements spaced from each other and disposed along a first axis;

an electrical resistance wire disposed at an acute angle to said first axis of said elements and having a bridging portion in contact with the front edges of the elements;

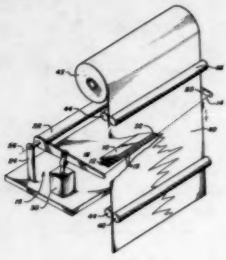
means for supporting the resistance wire at an acute angle to said first axis and operative to move the wire along a second axis transverse to the first axis, and to cause move-

ment of the bridging portion of the wire along the front edges of said elements;

means coupled to the support means for causing movement of the wire along the second axis in response to an input;

means for providing a voltage across said elements;

a thermally responsive sheet disposed in contact with the front edges of the elements;



the bridging portion of the wire being heated by electrical current flowing therethrough to a temperature sufficient to produce a visible image on the sheet;

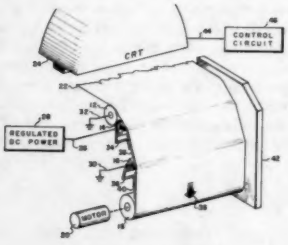
the movement of the bridging portion of the wire along said elements being magnified in relation to movement of the wire along the second axis.

4,394,665

ELECTRICAL CONTACT FOR CONDUCTIVE-BACKED PAPER

Gerald F. Kopp, Pine, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 26, 1982, Ser. No. 382,039
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—76 R **7 Claims**



1. Apparatus for use in a recorder having a moving conductive-backed paper to supply electrical energy to the conductive backing comprising:

a wire brush for applying a uniform heating current to the paper, the brush including a sufficient number of wire bristles to contact the conductive backing in a substantially continuous fashion across the paper so that all portions of the paper proximate the brush are contacted, the wire bristles being fine enough to bend and make a flexible contact with the conductive backing; and

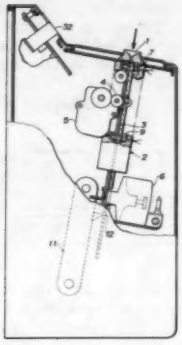
means connecting the wire brush to a source of electrical energy.

4,394,666

TIME RECORDER

Hiroshi Kato, Atsugi; Hisataka Ato, Yokohama; Osamu Inagaki, Kawasaki, and Hiroshi Matsuo, Yokohama, all of Japan, assignors to Amano Corporation, Yokohama, Japan

Filed May 15, 1981, Ser. No. 264,207
Claims priority, application Japan, May 20, 1980, 55-66611
Int. Cl.³ G07C *1/06*
U.S. Cl. 346—82 **9 Claims**



1. A time recorder capable of accepting a time card having a personal code of each individual time card user, of printing predetermined time data, for example, the time of day of acceptance of said time card on a predetermined line of said time card, and of ejecting said time card after said time is printed thereon, said time recorder comprising:

means defining a predetermined path of time card conveyance having an inlet opening into which said time card is at least partially manually inserted;

reading means for reading said personal code when said time card is inserted into said predetermined path;

storage means for electronically storing at least print line number data corresponding to said personal code read by said reading means;

printing means for printing said predetermined time data upon said time card;

motor means rotatable in a first direction for conveying said time card along said predetermined path after said time card is at least partially manually inserted into said inlet opening, and rotatable in a second direction opposite to said first direction for ejecting said time card from said time recorder after said predetermined time data is printed upon said time card; and

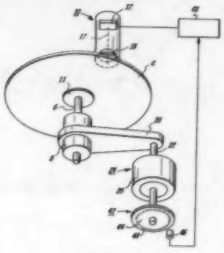
position determining means for determining the position of said time card relative said printing means so that said predetermined time data is printed upon a predetermined print line number of said time card, said position determining means including movable means for contacting and being displaceable with the bottom edge of said time card as said time card is conveyed through a portion of said predetermined path by said motor means, position signal generating means for generating a position signal responsive to said movable means, and comparator means for comparing said position signal and said stored print line number data and for stopping said motor means when said position signal is equal to said stored print line number data.

4,394,667

RADIAL ACCESS DRIVE FOR AN OPTICAL DISK RECORDER

David Cheng, San Jose, and Stephen T. Chai, Rancho Palos Verdes, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1982, Ser. No. 362,361
Int. Cl.³ G06K 15/02; G01D 15/32
U.S. Cl. 346—137 4 Claims



1. In a data recorder system including optical means for providing an information modulated light beam, a member including a data recording surface sensitive to said light beam, and first means for causing rotation of said data recording surface,

characterized in that

said optical means are held in a stationary position, and

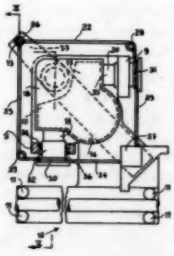
second means for moving said data recording surface along an arcuate path relative to said optical means.

4,394,668

ELECTRONIC PRINTER

Riccardo Brescia, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Italy

Filed Sep. 2, 1981, Ser. No. 298,790
Claims priority, application Italy, Sep. 22, 1980, 68467 A/80
Int. Cl.³ G01D 15/16; H01H 1/00
U.S. Cl. 346—139 R 10 Claims



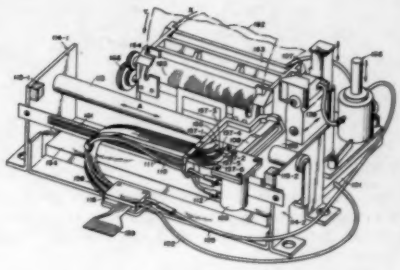
1. An electronic printer comprising a tracing element carried at one vertex of an articulated parallelogram, and actuating means responsive to electrical signals to distort the parallelogram so as to move the tracing element in two coordinate directions parallel to the printing plane, at least two of the arms of the parallelogram being constituted by thin fibres of elastic material, the articulated joints of the parallelogram being constituted by the end portions of the arms.

4,394,669

LIQUID JET RECORDING APPARATUS

Masakazu Ozawa, Yokohama; Kunio Watanabe; Shigeyuki Matsumoto, both of Kawasaki; Yukuo Nishimura, Sagamihara, and Takashi Miyazaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1981, Ser. No. 280,348
Claims priority, application Japan, Jul. 22, 1980, 55-100085; Jul. 22, 1980, 55-100086
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 R 5 Claims



1. A liquid jet recording apparatus comprising:

a first ink tank for storing an amount of ink;

a second ink tank position at a level higher than said first ink tank, and connected to a feed tube in communication with said first ink tank, said second ink tank receives the ink from said first tank through the feed tube, said first ink tank and said second ink tank being closed containers;

a recording head associated with said second ink tank for jetting the ink fed from said second ink tank; and

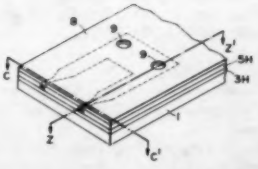
a carriage connected to said second ink tank and said recording head for reciprocally moving said second ink tank and said recording head together, wherein at least a portion of the feed tube is moved along the reciprocal movement path of said second ink tank thereby producing pressure in said second ink tank to feed the ink to said second ink tank from said first ink tank.

4,394,670

INK JET HEAD AND METHOD FOR FABRICATION THEREOF

Hiroshi Sugitani, Machida; Hiroto Matsuda, Yokohama; Koichi Kimura, Yamanashi, and Masami Ikeda, Chiba, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,466
Claims priority, application Japan, Jan. 9, 1981, 56-1856; Jan. 19, 1981, 56-94651; Jan. 19, 1981, 56-94654
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 R 19 Claims

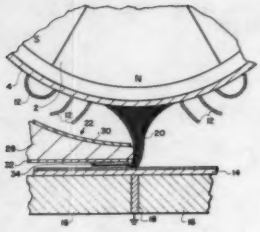


1. An ink-jet head comprising an ink flow path formed by laminating cured films of photosensitive compositions and an ink discharging orifice, at least the ink discharging orifice region being composed of the cured films.

4,394,671
ELECTROGRAPHIC RECORDING

Roger D. Erickson, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 30, 1980, Ser. No. 202,376
Int. Cl.³ G01D 15/06
U.S. Cl. 346—155 7 Claims



1. An electrographic recording system for recording information on an electrographic recording medium, comprising:
- a non-magnetic platen over which said recording medium passes;
- a multipolar magnetic structure;
- a non-magnetic shell;
- means mounting said shell for motion about said magnetic structure with the peripheral surface of said shell spaced a small predetermined distance above said platen;
- means for supplying magnetic toner particles to the outer surface of said shell;
- means for defining a recording station substantially at the position of nearest approach of said shell to the upper surface of said platen;
- an array of recording styli positioned at said recording station and spaced between the peripheral surface of said shell and said platen;
- said means for defining a recording station including a magnetically permeable strip secured to but insulated from the under surface of said array of recording styli, said magnetically permeable strip concentrating the magnetic field produced by said magnetic structure to form a dynamic bridge of toner particles between said shell and said recording medium at said recording station.

4,394,672
TITANIUM DIOXIDE RECTIFIER

Allen H. Meitzler, Ann Arbor; William T. Donlon, Jr., Detroit, and Samuel S. Schinozaki, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 22, 1981, Ser. No. 256,441
Int. Cl.³ H01L 27/24, 49/02, 29/12, 29/161
U.S. Cl. 357—10 5 Claims

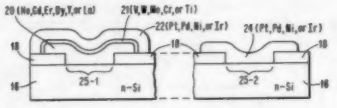
5. A rectifier comprising:
- a ceramic oxide main body having a pair of opposing major surfaces, said ceramic oxide being an oxide of a tetravalent metal atom;
- a pair of spaced metal electrodes disposed on said opposing major surfaces of said ceramic oxide main body, the material of said metal electrodes being selected from the group of platinum and palladium; and
- groupings of a combination of the electrode material and the tetravalent metal material interspersed throughout the ceramic oxide main body thereby forming a rectifier with electrodes of one material and having different forward and reverse electrical characteristics so that rectification is

derived from a microstructure, including said groupings, of said main body.

4,394,673
RARE EARTH SILICIDE SCHOTTKY BARRIERS

Richard D. Thompson, Millwood, N.Y.; Boryeu Tsaur, Arlington, Mass., and King-Ning Tu, Chappaqua, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1980, Ser. No. 191,565
Int. Cl.³ H01L 29/48
U.S. Cl. 357—15 10 Claims



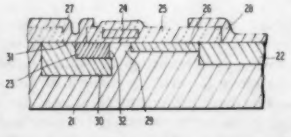
1. A disilicide Schottky barrier contact having a barrier potential of about 0.4 eV, comprising:
- an n-type silicon substrate; and
- a rare earth metal deposited on said n-type silicon substrate, wherein said disilicide Schottky barrier contact is formed by heating said silicon substrate and said rare earth metal.

6. A disilicide Schottky barrier contact having a barrier potential of about 0.7 eV, comprising:
- an p-type silicon substrate; and
- a rare earth metal deposited on said p-type silicon substrate, wherein said disilicide Schottky barrier contact is formed by heating said silicon substrate and said rare earth metal.

4,394,674
INSULATED GATE FIELD EFFECT TRANSISTOR

Hiraku Sakuma, and Toshiyuki Suzuki, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1980, Ser. No. 195,683
Claims priority, application Japan, Oct. 9, 1979, 54-130143; Nov. 13, 1979, 54-146668
Int. Cl.³ H01L 29/78
U.S. Cl. 357—23 9 Claims



1. An insulated gate field effect transistor comprising a

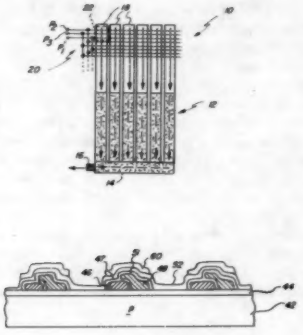
semiconductor substrate of one conductivity type, a source region and a drain region of the opposite conductivity type provided along one principal surface of said semiconductor substrate, a channel region between said source region and said drain region, a gate electrode provided on said channel region via a gate insulating film, and an impurity region of said one conductivity type having a higher impurity concentration than said semiconductor substrate, said impurity region being provided in contact with substantially the entire bottom of said source region excluding the side wall of said source region facing said channel region, said impurity region being led out to said one principal surface through a portion of said substrate other than said channel region and being ohmically connected to a source electrode jointly with said source region, said impurity region having an impurity concentration of 1×10^{18} cm^{-3} or higher, said semiconductor substrate having a bottom surface opposite to said one principal surface, said semiconductor substrate between said drain region and said bottom surface having an impurity concentration less than 1×10^{18} cm^{-3}.

4,394,675

TRANSPARENT ASYMMETRIC ELECTRODE STRUCTURE FOR CHARGE COUPLED DEVICE IMAGE SENSOR

Constantine N. Anagnostopoulos, Mendon, and Teh-Hsuang Lee, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 16, 1981, Ser. No. 244,366
Int. Cl.³ H01L *29/78, 29/04*
U.S. Cl. 357—24 **5 Claims**



1. A frame transfer type charge coupled image sensing device wherein photocharges are accumulated under a transfer electrode in the transfer channel of a CCD shift register, comprising:

(a) a semiconductor substrate;

(b) a transparent insulating layer formed on a light receiving surface of said substrate;

(c) a first set of transfer electrodes comprising a plurality of electrodes disposed in groups of one or more electrodes, said groups being disposed in spaced-apart relation on said insulating layer;

(d) a second set of transfer electrodes, disposed on said insulating layer between said groups of first transfer electrodes, said transfer electrodes of said second set being substantially wider than the transfer electrodes of said first set, and substantially transparent in the visible region of the spectrum; and

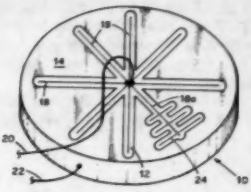
(e) means for blocking light from passing through said first set of transfer electrodes.

4,394,676

PHOTOVOLTAIC RADIATION DETECTOR ELEMENT

Dimitrios C. Agouridis, Oak Ridge, Tenn. (granted to U.S. Department of Energy under the provisions of 42 U.S.C. 2182)

Filed Dec. 17, 1980, Ser. No. 217,358
Int. Cl.³ H01L *27/14, 31/00, 29/161*
U.S. Cl. 357—29 **4 Claims**



1. A photovoltaic radiation detector element comprising:

a body of semiconductor material;

an electrically conductive current collector attached to said body and formed with a plurality of thin branch segments connected at a common point; and

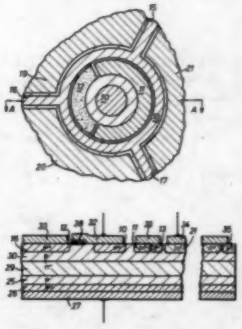
a photovoltaic junction forming coating on said body which closely approaches but is spaced from said current collector branch segments.

4,394,677

THYRISTOR FOR LOW-LOSS TRIGGERING OF SHORT IMPULSES WITH SCHOTTKY CONTACT TO CONTROL GATE ELECTRODE

Andre Jaecklin, Ennetbaden, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Aug. 29, 1980, Ser. No. 182,655
Claims priority, application Switzerland, Jan. 16, 1980, 342/80
Int. Cl.³ H01L *29/74*
U.S. Cl. 357—38 **12 Claims**



1. A disc-shaped thyristor device comprising:

a main thyristor formed of four alternating zones of opposite conductivity type including an n^+-doped cathode emitter, a p-doped cathode base, a n-doped anode base and a p-doped anode, wherein a portion of the cathode base emerges to a cathode-side surface and serves as a gate;

an integrated auxiliary thyristor provided for improving current rise time upon main thyristor ignition, said auxiliary thyristor comprising an n^+-doped region and p^+-doped secondary control region formed between the gate and the cathode emitter of the main thyristor; and

an integrated diode provided for shortening the turn-off time of the main thyristor during turn-off of current conduc-

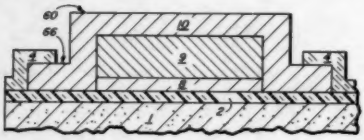
tion therethrough, said integrated diode comprising a Schottky contact formed between the gate and the cathode emitter on said cathode base of said main thyristor, said Schottky contact electrically connected to said gate by means of a metallization.

4,394,678

ELEVATED EDGE-PROTECTED BONDING PEDESTALS FOR SEMICONDUCTOR DEVICES

Vern H. Winchell, II, Phoenix; Thomas A. Scharr, Tempe, and Lowell E. Clark, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 19, 1979, Ser. No. 76,879
Int. Cl.³ H01L *23/48, 29/44, 29/52*
U.S. Cl. 357—68 **9 Claims**



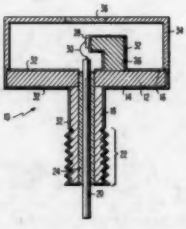
1. A bonding pedestal for a semiconductor circuit containing intra-circuit metallization comprising:
a semiconductor substrate;
a bonding pad having an outer aluminum layer and lying over a portion of said substrate, said outer aluminum layer comprising a peripheral portion and a central portion, said central portion having a substantially planar aluminum bonding surface, and wherein said bonding surface is higher than said peripheral portion;
a hard core under said central portion of said bonding pad, lying over said substrate and conformally covered on sides and top by said outer aluminum layer which forms said peripheral portion and said bonding surface; and
insulating means covering said peripheral portion but lying at a lower level than said bonding surface in a region surrounding said bonding pad.

4,394,679

LIGHT EMITTING DEVICE WITH A CONTINUOUS LAYER OF COPPER COVERING THE ENTIRE HEADER

Frank Z. Hawrylo, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 15, 1980, Ser. No. 187,160
Int. Cl.³ H01L *23/12, 23/36*
U.S. Cl. 357—81 **6 Claims**



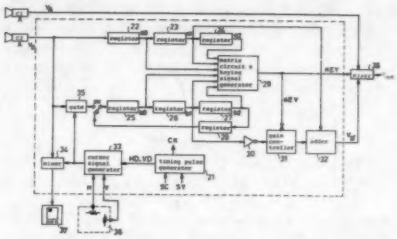
1. In a light emitting device which comprises:
a base plate having two major surfaces;
a stud axially mounted on a first major surface;
a copper block mounted on the second major surface of the base plate; and
a light emitting element mounted on the copper block;
the improvement which comprises:
a continuous layer of copper between about 5 and about 125 micrometers thick covering the base, the copper block and the stud.

4,394,680

COLOR TELEVISION SIGNAL PROCESSING APPARATUS

Toshiro Watanabe, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 31, 1981, Ser. No. 249,699
Claims priority, application Japan, Apr. 1, 1980, 55-42991; Apr. 1, 1980, 55-42992
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—22 **25 Claims**



1. A color television signal processing apparatus comprising:
a first and a second register means for selectively dividing a first and a second color television signals into sample signals indicative of picture element levels during periods of one n-th (n: integer) of one period of a color chrominance subcarrier signal and temporarily storing indicia of said sample signals for a predetermined number of sequential periods,
a calculation means for calculating correlationships, by use of said sample signals indicative of said picture element levels, between at least one color signal component contained in said first and said second color television signals, and for issuing a predetermined correlation signal,
a generating means for taking out at least one signal component among a chroma difference component and a luminance difference component from said correlation signal, and for generating a chromakey signal for controlling a signal level of said first color television signal, and
a mixing means for mixing the level-controlled first color television signal with a third color television signal.

4,394,681

OPTICAL SYSTEM FOR PROJECTION TELEVISION

William A. Rowe, Palatine, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

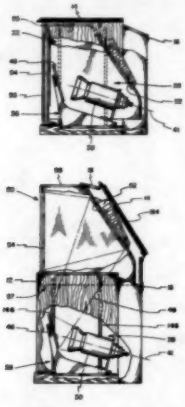
Filed Apr. 27, 1981, Ser. No. 258,206
Int. Cl.³ H04N *9/31*
U.S. Cl. 358—60 **9 Claims**

1. For use in an ultra-compact, rear-projection television receiver, a projection optical system protractible and retractible within a narrow spatial column for emerging from and nesting within a cabinet of said receiver, said optical system comprising in combination:
a stationary optical assembly permanently enclosed in a lower portion of said cabinet, said assembly having:
image projection means including at least one cathode ray tube means for forming a television image, and having associated projection lens means on a common axis therewith for projecting an aerial image of said television image a predetermined image projection distance along an optical path folded by optical path folding means, said common axis being oriented at a predetermined, steeply upward projection angle; and
first mirror means mounted closely adjacent to said image

projection means for receiving said aerial image, said first mirror being oriented at a fixed predetermined first mirror reflection angle effective to reflect said aerial image steeply upwardly along said folded optical path;

a protractible optical assembly elevatable as a unit from said cabinet including:

second mirror means located over said image projection means for receiving said aerial image reflected from said first mirror means when said protractible optical assembly is protracted, said second mirror means being oriented at a fixed predetermined second mirror reflection angle effective to reflect said aerial image forwardly, and when said protractible optical assembly is retracted, said predetermined second mirror reflection angle provides for angular conformance with said projection angle of said image projection means effectively permitting nesting of said second mirror with said image projection means;



rear projection screen means located appreciably forwardly of said second mirror means and vertically arranged for receiving, when said protractible optical assembly is protracted, said aerial image reflected from said second mirror means, and when said protractible optical assembly is retracted, said screen means is vertically arranged for nesting between a front panel of said cabinet and said first mirror means;

said projection angle of said image projection means, and said predetermined first and second mirror reflection angles being such that said protractible optical assembly, when retracted and nested, is overall depth-wise-shallow, and said receiver is as compact as a conventional, large-screen console television receiver, and when said protractible optical assembly is protracted within said narrow spatial column, said receiver remains depth-wise-shallow, yet is capable of displaying an image with an area greater than three times the image area of said conventional television receiver.

4,396,682

DC SWITCHING CIRCUIT

Eugene K. Severson, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 968,244, Dec. 11, 1978, Pat. No. 4,346,308. This application Oct. 14, 1981, Ser. No. 311,130

Int. Cl.³ H04N 9/27

U.S. Cl. 358—73 **4 Claims**

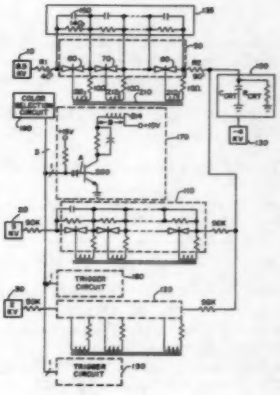
1. A bidirectionally conductive switching circuit for selectively coupling a plurality of dc high voltages to a beam penetration CRT, the switching circuit comprising:

a beam penetration CRT possessing a high voltage terminal having a capacitance that can be charged and discharged and also having a resistance high enough to limit the current due to the resistance to a value less than either of the first and second holding currents for the first and second serial strings of triacs recited below:

a first dc voltage supply;

a first serial string of triacs, each triac thereof having first and second conduction terminals and a gate terminal, the conduction terminals coupled serially between the first dc voltage supply and the high voltage terminal of the beam penetration CRT, the first serial string having a first holding current beneath whose value the string will no longer conduct in the absence of a signal applied to the gate terminals;

a first trigger means having a plurality of outputs each individually coupled to an associated gate terminal in the first serial string of triacs, for synchronously applying to the gate terminals a periodic signal switching the triacs conductive to charge the capacitance of the beam penetration CRT toward the voltage of the first dc voltage supply until the charging current falls below the value of the first



holding current and for thereafter maintaining the voltage at that level;

a second dc voltage supply of voltage different in value than the voltage of the first dc voltage supply;

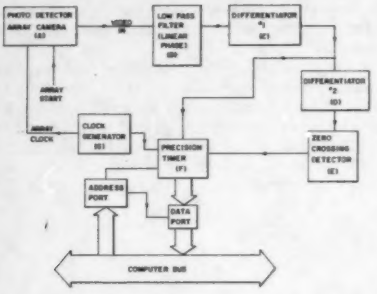
a second serial string of triacs, each triac thereof having first and second conduction terminals and a gate terminal, the conduction terminals coupled serially between the second dc voltage supply and the high voltage terminal of the beam penetration CRT, the second serial string having a second holding current beneath whose value the string will no longer conduct in the absence of a signal applied to the gate terminals; and

a second trigger means having a plurality of outputs each individually coupled to an associated gate terminal in the second serial string of triacs, for synchronously applying to the gate terminals a periodic signal switching the triacs conductive to discharge the capacitance of the beam penetration CRT toward the voltage of the second dc voltage supply until the discharging current falls below the value of the second holding current and for thereafter maintaining the voltage at that level.

4,394,683
NEW PHOTODETECTOR ARRAY BASED OPTICAL MEASUREMENT SYSTEMS

Nicholas Liptay-Wagner; Roland Renaud, both of Windsor; Timothy R. Pryor, Tecumseh, and Donald A. Clarke, Windsor, all of Canada, assignors to Diffracto Ltd., Canada

Filed Jun. 26, 1980, Ser. No. 163,290
Int. Cl.³ H04N 7/18
U.S. Cl. 358—107 55 Claims



1. Method for analyzing a light pattern produced on a photo detector array, comprising the steps of:

filtering the signal from said photodetector array with a low pass filter,

differentiating the output of the low pass filter to obtain a derivative of said filtered signal at at least one point in said pattern,

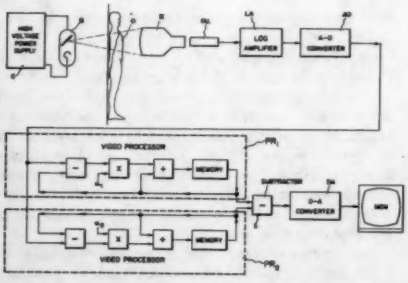
detecting the point of zero crossing of said differentiated signal, and

timing said zero crossing point relative to a reference point to obtain the position of at least one point.

4,394,684
DEVICE FOR DIFFERENTIAL IMAGE DETERMINATION

Leonardus A. J. Verhoeven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 165,174, Jul. 2, 1980, Pat. No. 4,350,998. This application Jan. 25, 1982, Ser. No. 342,330
Claims priority, application Netherlands, Jul. 19, 1979, 7905611
Int. Cl.³ H04N 7/18
U.S. Cl. 358—111 3 Claims



1. A device for processing current image information which has been separated into image elements comprising:

first video processor means comprising a first memory, multiplying and addition circuits connected at least with the first memory to form recursive filter means which functions to multiply the current image information by a factor α_1, to multiply image information received from an output of the first memory by a factor $(1-\alpha_1)$, with $0 \leqq \alpha_1 \leqq 1$, to add the resulting products on an elemental basis and to supply the resulting sum to an input of the first memory;

second video processor means comprising a second memory, multiplying and addition circuits connected at least with the second memory to form a recursive filter which functions to multiply the current image information by a factor α_2, to multiply image information received from an output of the second memory by a factor $(1-\alpha_2)$, with $0 \leqq \alpha_2 \leqq 1$, to add the resulting products on an elemental basis and to supply the resulting sum to an input of the second memory;

subtraction means connected to outputs of the first memory and the second memory which function to subtract image information in the first memory from image information in the second memory,

the factor α_1 being different from the factor α_2.

4,394,685
INTERFACE FOR OPERATING A DOT MATRIX PRINTER FOR PRINTING A VIDEO IMAGE

David Yeomans, Portmarnock, Ireland; Christopher J. Wilkinson, Cronborough, England; Damien McCartney, Drogheda, and Micheal O'Dwyer, Navan, both of Ireland, assignors to Centronics Data Computer Corporation, Hudson, N.H.

Filed Sep. 4, 1980, Ser. No. 184,079
Int. Cl.³ H04N 5/76
U.S. Cl. 358—264 23 Claims

1. A method for storing data for use in operating a printer of the dot matrix type from digitized video data comprising a composite sync signal incorporating field and line sync signals, a data signal incorporating digitized image data, and a clock signal incorporating regularly occurring time pulses for use in synchronizing the digitized data signals, said method comprising the steps of:

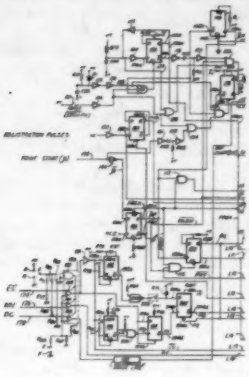
initiating an acquired data cycle upon detection of a next field signal when the printer is ready to print;

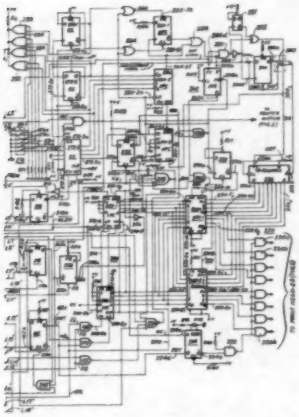
counting line sync signals occurring after the detection of the last-mentioned field sync signal;

counting timing pulses occurring after detection of each line sync signal; and

selecting a predetermined portion, less than the whole of the image data of each line, in accordance with the timing

pulse count, for storage in a random access memory at locations in the memory determined in accordance with





the line count associated with the portion of image data being stored.

4,394,686

METHOD AND SYSTEM FOR CORRECTING TIME BASE ERRORS IN BROADBAND SIGNALS STORED IN OR TRANSMITTED THROUGH A PLURALITY OF NARROW-BAND CHANNELS

Winfried Horstmann, Griesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 26, 1981, Ser. No. 247,774

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012070

Int. Cl.³ H04N *5/76, 7/12*

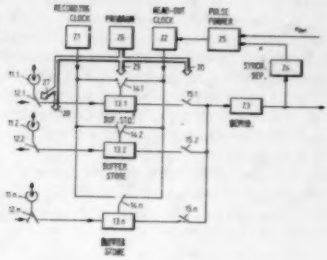
U.S. Cl. 358—134 **8 Claims**

1. In a method for reconstituting a television signal by readout at a predetermined readout rate for time transformation of individual segments of said signal stored after pickup from a record medium in a plurality of stores as received respectively from a plurality of narrow-band channels at a recording rate lower than said readout rate, said segments having been recorded on said medium after a time transformation reciprocal to said first-mentioned time transformation:

a method for correcting time base errors in the so reconstituted television signals, comprising the steps of

furnishing a sequence of reference television line synchronization signals;

separating output line synchronization signals from said reconstituted television signal;



producing for every television line a pulse lasting for substantially all the time lapse between the arrival of one of said output line synchronization signals and the next of said reference synchronization signals; and

delaying the beginning of readout for the next television line of said individual signal segments by applying said pulse lasting for said time lapse to interrupt the furnishing of readout clock pulses for readout purposes.

4,394,687

APPARATUS FOR DECODING DIGITAL INFORMATION PROCESSED FOR INCLUSION IN WIDE BAND T.V. VIDEO SIGNAL

Peter R. Hutt, Stoner End, Froxfield, Petersfield, Hampshire, and John J. Moyce, 21 Culver Rd., Newbury, Berkshire, both of England

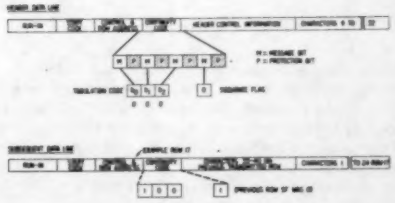
PCT No. PCT/GB80/00078, § 371 Date Dec. 30, 1980, § 102(e) Date Dec. 30, 1980, PCT Pub. No. WO80/02489, PCT Pub. Date Nov. 13, 1980

PCT Filed Apr. 30, 1980, Ser. No. 227,050

Claims priority, application United Kingdom, Apr. 30, 1979, 7914977

Int. Cl.³ H04N *7/08*

U.S. Cl. 358—147 **7 Claims**



1. A television receiver system for receiving digital information signals transmitted with a conventional wide band video signal to enable display of the information represented by the digital information signal in a display having predetermined numbers of rows and columns of characters, the information signals being transmitted in lines each of which contain data relating to a number of characters less than the predetermined number of columns in the display, comprising:

means for receiving the digital information signals separated from the wide band video signals;

means for storing said digital information signals for display in said predetermined numbers of rows and columns;

means for detecting in the digital information signals a tabulation control code indicative of the presence of digital information relating to two rows of the display in an information line and including row and column addressing codes and wherein said means for detecting includes row address and column address detecting means for respectively detecting the row and column addressing codes, means for retaining an immediately previous row address for a subsequently received data information line when said detecting means detects said control code, and wherein the column address detecting means controls the retaining means to change the row address to that received from said subsequently received data information line at a time determined by the detected column address received from said subsequently received data information line; and

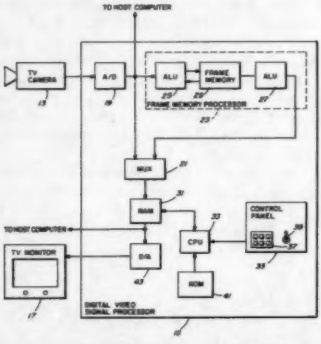
means for controlling the storage addressing of said digital information signals in said means for storing in accordance with said control code to ensure proper read out for display of the information.

4,394,688

VIDEO SYSTEM HAVING AN ADJUSTABLE DIGITAL GAMMA CORRECTION FOR CONTRAST ENHANCEMENT

Hitoshi Iida, Bedford, and Pay-Shin King, Newton, both of Mass., assignors to Hamamatsu Systems, Inc., Waltham, Mass.

Filed Aug. 25, 1981, Ser. No. 296,068
Int. Cl.³ H04N 5/14, 5/20
U.S. Cl. 358—160 **9 Claims**



1. A video system comprising a television camera for converting visual information into analog video signals, a digital video signal processor for digitally processing said anolog video signals and a television monitor for displaying an image of the processed analog video signals, said digital video signal processor including:

a. an analog to digital converter for converting the analog video signals into video data,

b. a first memory device for modifying the video data according to the particular contents contained therein,

c. a second memory device, said second memory device having stored therein a plurality of table-look-ups, each table-look-up corresponding to a different gamma correction,

d. a central processing unit for controlling the operations of the digital video signal processor, said operations including reading out one of said table-look-ups in said second memory device and writing said read data into said first memory device,

e. a manually operated control device for controlling the operations of the central processing unit, said control device including means for selecting the particular table-look-ups to be read by said central processing unit, and

f. a digital to analog converter for converting the modified video data from said first memory device into analog video signals.

5. A method of manipulating video picture data for the purpose of enhancing contrast over certain areas of interest comprising:

a. passing said video picture data through a first memory device which is arranged to modify the video picture data according to the contents of a table-look-up contained therein,

b. providing a second memory device having therein a plurality of different table-look-ups, each table-look-up corresponding to a different gamma correction, and

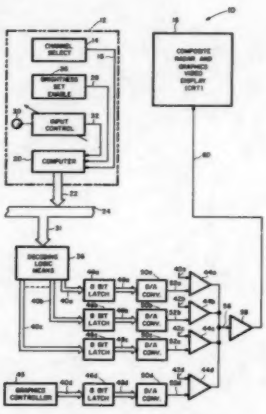
c. selectively reading out one of said table-look-ups from said second memory device and writing said table-look-up so read into said first memory device.

4,394,689

PROGRAMMABLE CRT BRIGHTNESS CONTROL

Edward L. Wallace, Ellicott City, and Theodore Wright, Crownsville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 13, 1981, Ser. No. 282,357
Int. Cl.³ H04N 5/14
U.S. Cl. 358—168 **4 Claims**



1. A system including means for selectively displaying any one of a plurality of video channels on a cathode ray tube display means, said system being characterized by the improvement comprising:

a manually actuable brightness set enable means for providing an enable signal while actuated;

a manually operable control means for providing a selectively variable brightness input signal;

computer means, responsive to coincidence of said enable signal and said brightness input signal for providing a digital word output representative of the currently displayed channel and a display brightness level corresponding to said input signal;

decoding means, responsive to said digital word output to provide a plurality of separate digital words each representative of a selected brightness level for one of said channels;

a plurality of digital storage and readout means each corresponding to one of said channels and operative to store the digital words for that channel upon deactivation of said

enable signal, and to read out said digital word whenever the corresponding channel is being displayed;

means for converting each digital word to a brightness level control signal when the corresponding channel is displayed;

said display means being responsive to said brightness level control signal whereby a predetermined brightness level of the display means is effected for each channel upon its display.

4,394,690

VARIABLE ASPECT RATIO TELEVISION RECEIVER

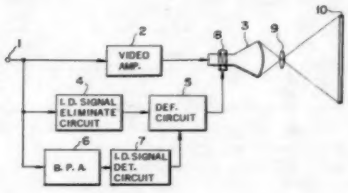
Katsumi Kobayashi, Machida, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 24, 1981, Ser. No. 257,389

Claims priority, application Japan, Apr. 25, 1980, 55-55871[U]

Int. Cl.³ H04N 3/22, 5/74

U.S. Cl. 358—180 **10 Claims**



1. In a variable aspect ratio television receiver comprising:

a video signal input terminal supplied with a video signal which can be either a standard composite video signal intended to be displayed at with standard aspect ratio or a non-standard composite video signal having an identification signal and intended to be displayed with a non-standard aspect ratio;

a video amplifier having an input connected to said video input terminal and an output providing an image output signal;

an image reproducing apparatus supplied with the image output signal from said amplifier and displaying a video picture;

deflecting means associated with said image reproducing apparatus and developing said video picture according to a predetermined format with a deflection height and a deflection width, such that a portion of said video signal occurs in an overscan portion beyond the deflection height of said format;

an identification signal detecting circuit supplied with said input video signal for detecting the presence of said identification signal carried in said non-standard composite video signal; and

a deflection width changing circuit means connected between said identification signal detecting circuit and said deflecting means for changing said deflection width developed at said deflecting means in response to said identification signal, thereby varying the aspect ratio of said video picture; the improvement in which said identification signal is carried in said non-standard composite video signal during said overscan portion of said video picture of said non-standard video signal, and said identification signal detecting circuit includes means adapted for detecting of said identification signal during said overscan period.

4,394,691

REMOTE CONTROL SYSTEM

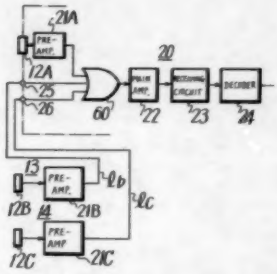
Toshio Amano, Tokyo; Kunio Nagai, and Juri Honma, both of Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,517

Claims priority, application Japan, Aug. 8, 1980, 55-113240[U]

Int. Cl.³ H04N 5/44

U.S. Cl. 358—194.1 **12 Claims**



1. A remote control system for selectively controlling a desired one of plural devices by the remote transmission of control signals from a transmitter, said system comprising:

central control means including decoding means for decoding a remotely transmitted control signal to produce a corresponding device control signal, said central control means being coupled to said plural devices for controlling said desired device with said device control signal;

plural receiving means spatially separated from each other, each receiving means receiving said remotely transmitted control signal;

at least one input terminal provided on said central control means, said at least one input terminal being coupled to one of said receiving means for receiving a remotely transmitted control signal therefrom; and

means for supplying the remotely transmitted control signal received at said at least one input terminal to said decoding means, whereby a desired device is controlled in response to a remotely transmitted control signal received by said receiving means coupled to said at least one input terminal.

4,394,692

HOUSING ASSEMBLY FOR AN ELECTRICAL APPARATUS

Rein S. Randmae, Fort Salonga, and Todd H. Whitaker, Smithtown, both of N.Y., assignors to Vicon Industries, Inc., Plainview, N.Y.

Filed Nov. 27, 1981, Ser. No. 325,582

Int. Cl.³ H04N 5/30

U.S. Cl. 358—229 **7 Claims**

1. A housing assembly for an electronic surveillance camera comprising:

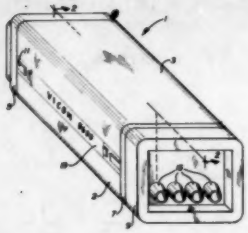
a lower housing for providing support to said camera having a frame portion at the rearward end thereof, said rear frame portion defining an open space through which connections may be made from the exterior of said housing assembly to its interior;

an upper housing matingly engaging said lower housing to create an enclosed region within said housing assembly;

an end cap detachably connected to said frame portion of said lower housing and covering said open space in said frame portion to seal said enclosed region from contaminants external to said housing assembly,

said end cap being constructed of a single piece of resilient material and comprising:

means for relieving strain on a cable entering said housing assembly through said end cap, said end cap having a slit communicating with said strain relief means for facilitating entry of cables therethrough, and



resilient notched protrusions extending from said end cap and spaced so as to engage the inner rim of said frame portion to provide detachable connection between said end cap and said frame portion.

4,394,693

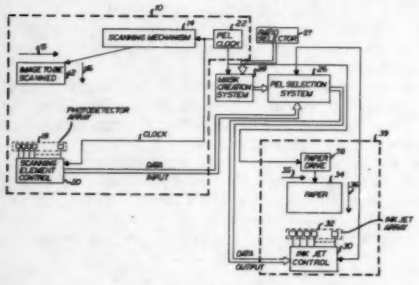
SYSTEM AND METHOD FOR GENERATING ENLARGED OR REDUCED IMAGES

Robert E. Shirley, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 23,404, Mar. 23, 1979, abandoned. This application Dec. 15, 1980, Ser. No. 216,555

Int. Cl.³ H04N *1/22*

U.S. Cl. 358—298 **20 Claims**



1. A system for reproducing an original image of given size in a selectable reproduced size that is variable within a substantial range, comprising:

scanning means for generating a pel array pulse train representative of intensity variations of individual pels in a pel array of rows and columns on the original image;

scanning recorder means for generating dot patterns in rows and columns on a reproduced image medium; and processor means responsive to the pel array pulse train generated by the scanning means for altering the pel array pulse train to modify the number of rows and columns in the pel array of rows and columns on the original image, the processor means including means for selecting one of a plurality of different scale factors, means responsive to a selected scale factor for generating a coded pulse train having pulse positions synchronized with the pel array pulse train, the coded pulse train being comprised of pulses of first and second values, the arrangement of which is determined by the selected scale factor and varies for different scale factors, means for sequentially storing the individual pulses of the coded pulse train, means for sequentially applying the stored individual pulses of the coded pulse train to alter the pel array pulse train, and means for providing the altered pel array pulse train to the scanning recorder means to modulate the dot patterns generated thereby.

4,394,694

TAPE SYNCHRONIZING APPARATUS

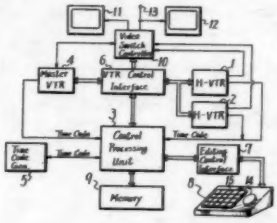
Ichiro Ninomiya, Kanagawa, and Jun Takayama, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 23, 1980, Ser. No. 189,576

Claims priority, application Japan, Sep. 27, 1979, 54-124368; Nov. 19, 1979, 54-149859

Int. Cl.³ G11B *27/00*; H04N *5/78*

U.S. Cl. 360—14.3 **7 Claims**



1. A video tape synchronizing system for a helical scan video tape recorder which uses a video tape having information signals and time code signals recorded thereon and which is adapted to reproduce said information signals from said video tape when the latter is moved at any one of a plurality of different speeds, comprising:

time code reader means for reading out said time code signals recorded on said video tape which is used in said helical scan video tape recorder;

selecting means for setting a direction and any one of said plurality of different speeds of movement of the video tape at an in-point, wherein said in-point indicates a starting point for playing back information signals recorded in said video tape; and

control processing means for determining a pre-roll point at which said video tape is to be stopped by determining the distance between said in-point and said pre-roll point in response to said time code signals read out by said time code reader means which correspond to said in-point of said video tape and said set direction and said set one of said plurality of different speeds of movement of said video tape at said in-point, and for controlling said helical scan video tape recorder to stop said video tape at said pre-roll point.

4,394,695

METHOD AND APPARATUS FOR EVALUATING RECORDING SYSTEMS

Douglas K. Mahon, Boulder Creek, Calif., assignor to Sharp Corporation, Osaka, Japan

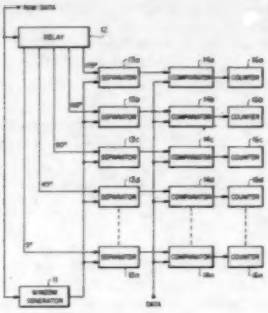
Filed Feb. 2, 1981, Ser. No. 230,699

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—53 **7 Claims**

1. Apparatus for evaluating recording systems including means responsive to the raw data for generating a plurality of data windows having leading and trailing edges, a plurality of data separators connected to receive said data windows and the reproduced data and serving to separate out data which falls outside the windows, means for providing at each of said

separators different relative positions between at least one edge of said window and said data to thereby provide different



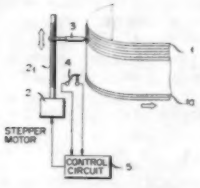
effective sized windows at each of said separators for separating out the data.

4,394,696

APPARATUS FOR POSITIONING MAGNETIC HEAD TO POSITION CORRESPONDING TO REFERENCE TRACK ON MAGNETIC TAPE

Tomohisa Yoshimaru, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 27, 1981, Ser. No. 248,288
Claims priority, application Japan, Apr. 1, 1980, 55-42437
Int. Cl.³ G11B *21/08, 5/55, 17/00*
U.S. Cl. 360—78 **2 Claims**



1. In a magnetic tape apparatus provided with a magnetic head movable in a direction perpendicular to the direction of running of a magnetic tape having a plurality of data tracks extending in the running direction thereof and a stepper motor for moving the magnetic head in the direction perpendicular to the running direction of the tape with respect to a reference position corresponding to a reference track of the tape, said stepper motor including a rotor and a plurality of phase windings successively excited by a drive pulse signal, apparatus for positioning said magnetic head to said reference position comprising:

detecting means for detecting the arrival of said magnetic head at the neighborhood of said reference position when said head is moved toward said reference position;

a plurality of selectable switches for specifying the phase and the corresponding phase winding which will be excited when said head is at said reference position; and

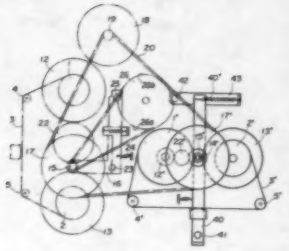
control circuit means connected to said detecting means, said switches and said stepper motor for causing said stepper motor to stop said magnetic head at said reference position when the previously specified phase winding of said step motor is excited after the detection of arrival of said magnetic head at the neighborhood of said reference position by said detecting means to thereby obtain the reference position of said magnetic head.

4,394,697

MAGNETIC RECORDING/REPRODUCING APPARATUS

Tsutomu Kurosawa, Ohmiya, Japan, assignor to Sahi Electronics Co., Ltd., Ohmiya, Japan

Filed Aug. 13, 1980, Ser. No. 177,736
Int. Cl.³ G11B *15/32;* B65H *51/28;* H04M *1/65*
U.S. Cl. 360—91 **9 Claims**



1. Recording-reproducing apparatus for the automatic answering of telephones comprising:

first and second independently movable, elongated, flexible recording media, one for storing a pre-recorded message to be transmitted and the other for recording an incoming message,

first supply and take-up means for the first of said media for effecting forward and rewind movements thereof,

second supply and take-up means for the second of said media for effecting forward and rewind movements thereof,

motive means,

cam means driven by said motive means,

first pivotable lever means formed with first follower means for following said cam means and with first pulley means driven by said motive means,

second pivotable lever means formed with second follower means for following said cam means and with second pulley means driven by said motive means,

said first lever means being pivoted in response to the movements of said first follower means in such a manner as selectively to bring said first pulley means into driving relation with at least said first take-up means and thereby control at least the forward movement of the first of said recording media, and

said second lever means being pivoted in response to the movements of said second follower means in such a manner as selectively to bring said second pulley means into driving relation with at least said second take-up means and thereby control at least the forward movement of the second of said recording media.

4,394,698

APPARATUS FOR AUTOMATIC INVERTING OF CASSETTES

Etienne A. M. Schatteman, Wemmel, Belgium, assignor to Staar S. A., Belgium

Filed Mar. 19, 1981, Ser. No. 245,381
Int. Cl.³ G11B *5/00, 15/68*
U.S. Cl. 360—96.5 **10 Claims**

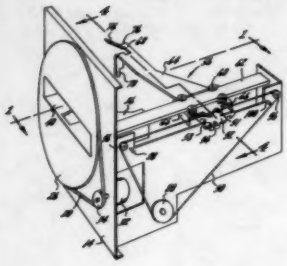
1. Apparatus for inverting a cassette for use in connection with a recorder/playback device, the inverting apparatus comprising:

(a) a rotatable magazine for receiving the cassette and inverting the cassette during rotation of the magazine;

(b) movable stop means for stopping and retaining the cassette at a holding position within the magazine; and

(c) transfer means separate from said rotatable magazine for removing the cassette from said holding position in the

rotatable magazine and conveying the cassette to an operating position in the recorder/playback device, said transfer means engaging and moving said stop means to release the cassette.

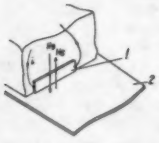


4,394,699

THIN-FILM MAGNETIC HEAD

Nobuyuki Kaminaka, Moriguchi; Kenji Kanai, Neyagawa; Norimoto Nouchi, Katano, and Noboru Nomura, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 20, 1981, Ser. No. 236,307
Claims priority, application Japan, Feb. 21, 1980, 55-21099
Int. Cl.[3] G11B *5/12, 5/30, 5/22*
U.S. Cl. 360—113 9 Claims



1. A thin-film magnetic head comprising a substrate, a layer of magnetoresistive element deposited on said substrate at a temperature other than at room termperature and a conductor layer for supplying said magnetoresistive element with an electric current in the longitudinal direction thereof, wherein:

said substrate comprises a single crystal material;

at least two crystal axes of said substrate material are in parallel with the surface on which said layer of magnetoresistive element is deposited, the coefficient of thermal expansion of the substrate being different in the directions of said crystal axes;

the orientations of said crystal axes and the coefficients of thermal expansion in said directions are in the relationship such that an internal stress is set up within said magnetoresistive element in parallel or perpendicular to said longitudinal direction of said element due to the difference between the temperature during the deposition of said element and room temperature; and

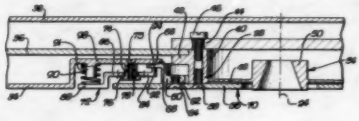
the magnetostriction coefficient of said element is selected so that said set up stress has the effect of orienting the spins within said element in said longitudinal direction.

4,394,700

RESTRAINING AND SEALING MECHANISM FOR DISC CARTRIDGE

Roy J. Edwards, San Jose, Calif., assignor to Disctron, Inc., Milpitas, Calif.

Filed Apr. 1, 1981, Ser. No. 249,899
Int. Cl.[3] G11B *23/04*
U.S. Cl. 360—133 17 Claims



1. In a cartridge containing a rotatable disc oriented generally parallel to the top and bottom of the cartridge and attached to a hub assembly, said hub assembly rotatable about an axis by a disc-drive assembly through an opening in the bottom of said cartridge and displaceable axially with respect to said cartridge, said cartridge for insertion into a disc-drive assembly, a mechanism for restraining the movement of said magnetic disc and hub assembly relative to said cartridge and for sealing said cartridge when said cartridge is not inserted into said disc-drive assembly comprising:

an annular surface on said cartridge near said opening, said annular surface fixed with respect to the top and bottom of said cartridge;

an annular flange carried by said hub assembly having an annular sealing surface generally opposite to said annular surface on said cartridge and configured to sealingly engage said annular surface on said cartridge; and

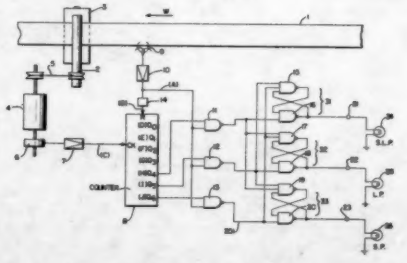
means for axially pressing said annular sealing surface on said flange against said annular surface on said cartridge by pressing on an annular surface of said hub assembly, said means acting when said cartridge is not inserted into said disc-drive assembly to restrain said disc and hub assembly from rotating and to seal said cartridge about said opening, said means being located peripherally about said hub assembly near the bottom of said cartridge and outside that portion of the cartridge containing the disc.

4,394,701

RECORDING TIME MODE DETECTOR

Kouichi Igata, Hirakata, and Masaaki Kobayashi, Kawanishi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 19, 1980, Ser. No. 208,476
Claims priority, application Japan, Nov. 24, 1979, 54-152324; Mar. 21, 1980, 55-36676; Jul. 3, 1980, 55-91486
Int. Cl.[3] G11B *15/52*
U.S. Cl. 360—137 3 Claims



1. In a multi-speed video tape recorder/reproducer utilizing a magnetic tape having video information and control signals recorded thereon, and having a magnetic tape driving means comprising a capstan, and further having one of said control

signals recorded on said magnetic tape indicative of a video frame, a recording time mode detector for detecting the recording time mode of the video information recorded on said magnetic tape, said recording time mode detector comprising:

a reproducing head means for reproducing said control signals recorded on said magnetic tapes;

a frequency generator means operatively mechanically connected to said capstan for providing a signal indicative of the number of rotations of said capstan;

a counter means for counting the number of pulses output by said frequency generator means during a video frame, a clock input of said counter means being connected to said frequency generator means and a reset input of said counter means being connected to said reproducing head means;

a decoder and storage means operatively connected to said reproducing head means and said counter means for detecting and storing the recording time mode of said magnetic tape by determining the count stored in said counter means during one video frame;

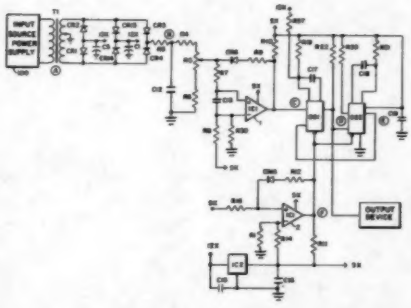
and indicator means operatively connected to said decoder and storage means for indicating the detected recording time mode.

4,394,702

POWER FAILURE DETECTION AND CONTROL CIRCUIT

Guy Boothe, Laguna Beach, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,887
Int. Cl.³ H02H *3/24*
U.S. Cl. 361—92 **10 Claims**



1. A circuit for detecting the condition of a power source comprising,

a first pulse circuit (1, OS1) for selectively generating pulses (D) of a first time period and frequency as a function of the signal (C) supplied thereto from said power source,

a second pulse circuit (OS2) for selectively generating pulses (E) of a second time period and frequency as a function of the pulses (D) supplied thereto by said first pulse circuit, said second pulse circuit selectively supplying pulses to said first pulse circuit to effectively disable said first pulse circuit, and

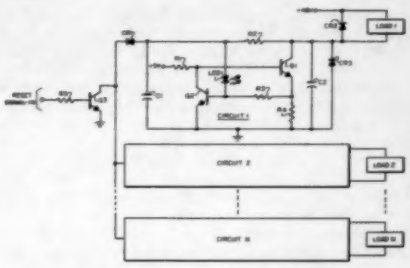
reset circuit means (2, etc) connected between said power source and each of said first and second pulse circuits to reset said first and second pulse circuits to a prescribed condition when said power source has returned to a prescribed level.

4,394,703

LOAD PROTECTING ARRANGEMENT

James S. Butcher, Glendale Heights, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 24, 1981, Ser. No. 334,188
Int. Cl.³ H02H *3/08*
U.S. Cl. 361—101 **17 Claims**



1. A protection circuit for use between a first source of DC power and a load, comprising:

current pass means connected between said load and said DC source;

DC bias means connected to said current pass means, conditioning said current pass means to conduct therethrough, current from said first DC power source to said load;

sensing means connected to said current pass means;

control means connected to said sensing means and to said current pass means, initially operated in response to detection of a flow of current in excess of a predetermined value, from said first source to said load by said sensing means, to operate said current pass means to limit the flow of current therethrough;

feedback means connected between said current pass means and said control means, developing a signal in response to said limiting of current flow through said current pass means, to render said control means fully operated, and render said current pass means inoperative;

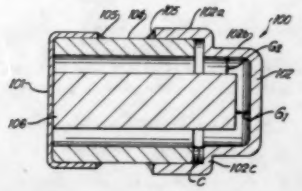
and reset means operated in response to said rendering of said current pass means inoperative, to disable said feedback means developed signal to thereby render said current pass means reoperated.

4,394,704

SURGE ARRESTER ASSEMBLY

Raymond D. Jones, Cheam, England, assignor to TII Corporation, Lindenhurst, N.Y.

Division of Ser. No. 18,360, Mar. 6, 1979, Pat. No. 4,320,435.
This application Oct. 30, 1981, Ser. No. 316,897
Int. Cl.³ H02H *1/04*
U.S. Cl. 361—119 **4 Claims**



1. A two electrode gas tube arrester comprising,

(a) an insulating tubular member having a central bore;

(b) first conductive end cap means carried on one end of said tubular member and in abutting relationship thereot, said end cap means including a central conductor extending

axially thereon through said tubular member to present the free end thereof beyond the other end of said tubular member;

(c) second conductive end cap means carried on said other end of said tubulr member, said second end cap means having a portion extending over said free end of said conductor such that an ionization gap is defined therebetween;

(d) said second end cap means including a first cylindrical portion bonded to the external surface of said tubular member and a second cylindrical portion of reduced diameter joined thereto by a shoulder portion, and further including a circular portion in juxtaposition to said free end of said conductor, said ionization gap being defined (i) by the space between said conductor free end and said circular portion or (ii) by the space between said conductor and said second reduced diameter portion;

(e) said shoulder and said other end of said tubular member defining a clearance therebetween for controlling the size of said first mentioned ionization gap space;

(f) said first and second end cap means being joined to said tubular member in gas tight relationship to form a control volume; and

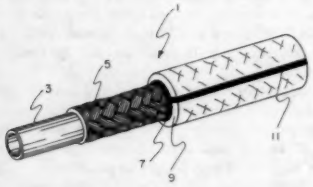
(g) ionizable gas in said control volume.

4,394,705

ANTI-STATIC HOSE ASSEMBLIES

Lawrence P. Blachman, Reading, Pa., assignor to The Polymer Corporation, Reading, Pa.

Filed Jan. 4, 1982, Ser. No. 336,711
Int. Cl.³ H05F *3/00*
U.S. Cl. 361—215 **6 Claims**



1. An anti-static hose comprising:

a tube which is a tubular component of the hose;

a reinforcement which is high tenacity yarns applied in tensioned relationship over the tube;

a static drain which is a conductive layer over the reinforcement; and,

a cover which is a continuous protective layer of polymeric material enveloping the static drain and the reinforcement, the improvement comprising:

a stripe of a conductive polymer extending through the cover and along the length of the hose, which stripe forms a portion of the outer surface of the cover and is in contact with the static drain.

4,394,706

POWER CONVERTER FOR RECREATIONAL VEHICLES

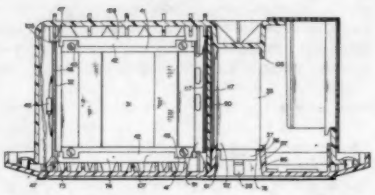
Daniel J. Crafts, Battle Creek, Mich., assignor to Progressive Dynamics, Inc., Marshall, Mich.

Filed Jul. 11, 1979, Ser. No. 56,605
Int. Cl.³ H05K *5/02*
U.S. Cl. 361—331 **24 Claims**

1. A power converter for recreational vehicles, comprising:

(a) at least two electrical components being electrically interconnected for altering the characteristics of a source of electrical power;

(b) a housing adapted for mounting in said recreational vehicle, and including first and second portions; each of said housing portions having an interior surface with sockets positioned thereon for said electrical components; each of said sockets being shaped to telescopically receive therein one end of an associated electrical component and surround said component end on each side thereof to retain the same in place; said sockets being arranged in pairs with one member of each pair disposed in said first and second housing portions, respectively, and the members of each socket pair being aligned for receiving the associated electrical component therebetween; each of



said sockets having a central axis which is disposed in a mutually parallel relationship; and

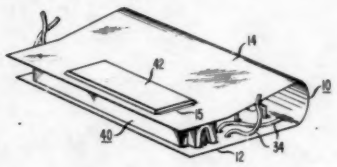
(c) said first and second housing portions being interconnected with alignment of said socket pairs, and convergence of the same along an axis parallel with the axes of said sockets, with opposing ends of said electrical components positioned between and aligned with the associated socket pair, whereby each of said electrical components is captured therebetween to securely mount said electrical components in said housing without separate fasteners.

4,394,707

ELECTRICAL CIRCUIT PACKAGE

John J. Consoli, Indianapolis, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 26, 1981, Ser. No. 238,470
Int. Cl.³ H05K *1/02*
U.S. Cl. 361—398 **3 Claims**



1. An electrical circuit package comprising:

a flexible dielectrical substrate;

a single first portion of the dielectrical substrate having located thereon all electrically conductive paths and all electrical components associated with the circuit package, the components being electrically connected to the conductive paths on the first portion;

at least one electrical component supported on the first portion of the substrate including an integral catch remote to the electrical connection of the component to the conductive paths on the first portion; and

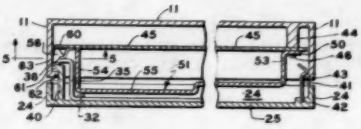
a single second portion of the dielectric substrate extending lengthwise from the first portion, the second portion being free of any electrically conductive paths and electrical components, the second portion having integral means for cooperating with the catch on the component to secure the two portions together, the second portion being at least equal in length to the first portion and being folded over and secured to the first portion to provide an electrically insulating protective cover for the components.

4,394,708

ELECTRONIC THERMOSTAT WITH PROTECTED CIRCUITRY

Donald J. Kasprzyk, Maple Grove, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 6, 1981, Ser. No. 261,067
Int. Cl.³ H05K 5/02
U.S. Cl. 361—399 8 Claims



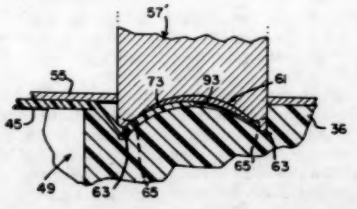
1. An electronic thermostat having circuit components that are subject to electrical and mechanical damage, including: mounting base means and cover means forming said electronic thermostat when said base means and said cover means are mounted together; circuit board means including electronic circuit components that are susceptible of electrical and mechanical damage; said circuit board means further having contact means in the form of a plurality of separate individual contact members mounted upon said board means and connected to said electronic circuit components; said circuit board means mounted within said cover means; insulating enclosure means mounted within said cover means to partially enclose said circuit board means to protect said circuit board means from damage by accidental contact with said circuit board means; said insulating enclosure means including barrier means which form separate individual plural contact openings of limited size to provide access to said individual contact members through said contact openings; said base means adapted to be mounted upon a surface with said base means including connection means; and said base connection means including separate plural electric base contact members that project from said base means through said openings to engage said circuit board contact members to complete electric connections from said base means to said circuit board means to complete the mounting of said electronic thermostat.

4,394,709

DIE-STAMPED CIRCUIT BOARD ASSEMBLY HAVING RELIEF MEANS TO PREVENT TOTAL SWITCH DEFORMATION

Boyd G. Brower, and John W. Shaffer, both of Williamsport, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 131,614, Mar. 19, 1980, Pat. No. 4,320,572.
This application Jan. 4, 1982, Ser. No. 336,531
Int. Cl.³ H05K 3/20
U.S. Cl. 361—401 11 Claims



1. A circuit board assembly for use within a photoflash device, said circuit board assembly comprising:

a dielectric substrate;

a thin, electrically conductive switching element positioned on said dielectric substrate and having a portion thereof die-stamped an established distance within a surface of said dielectric substrate;

an electrically conductive member die-stamped within said surface of said dielectric substrate simultaneously with said switching element and having a part thereof located on said portion of said switching element die-stamped within said substrate, said die-stamping electrically connecting said conductive member to said portion of said switching element; and

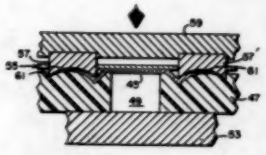
relief means located within said dielectric substrate for preventing total severing of said switching element during said die-stamping thereof within said dielectric substrate, at least one segment of said portion of said switching element die-stamped within said substrate being aligned with said relief means during said die-stamping and thereafter being positioned within said relief means such that said segment is not severed, at least one part of said die-stamped portion of said switching element adjacent said die-stamped segment of said portion being deformed or severed by said die-stamping.

4,394,710

DIE-STAMPED CIRCUIT BOARD ASSEMBLY FOR PHOTOFLASH DEVICES

Boyd G. Brower, Williamsport; David R. Broadt, Lewisburg, and John W. Shaffer, Williamsport, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 131,711, Mar. 19, 1980, Pat. No. 4,325,771.
This application Jan. 4, 1982, Ser. No. 336,532
Int. Cl.³ H05K 3/20
U.S. Cl. 361—401 15 Claims



1. A circuit board assembly for use within a photoflash device, said circuit board assembly comprising:

a dielectric substrate;

at least one thin, electrically conductive switching element having a portion thereof die-stamped an established distance within a surface of said substrate; and

at least one thin, electrically conductive metallic member die-stamped within said surface of said substrate simultaneously with said switching element and having a part thereof located on said die-stamped portion of said switching element, said die-stamping electrically connecting said conductive member to said portion of said switching element and securedly positioning both said conductive member and said switching element on said dielectric substrate without severing said switching element.

4,394,711

CIRCUIT BOARD WITH WELDABLE TERMINALS

Larry R. Conley, Fountain Valley, Calif., assignor to Interconnection Technology, Inc., Costa Mesa, Calif.

Division of Ser. No. 44,404, Jun. 1, 1979, Pat. No. 4,242,719.
This application May 27, 1980, Ser. No. 153,565
Int. Cl.³ H05K 1/18
U.S. Cl. 361—408 9 Claims

1. A solderable and weldable circuit board apparatus comprising:

a base board having a multiplicity of holes therein;

a layer of solderable material disposed on said base board and forming a plurality of separate connection regions, the

layer in each of said regions plating a plurality of holes and an area on said base board which connects the holes; and

a plurality of pins of weldable material, each lying in a selected one of said holes and having an electrode-engageable end to enable the welding of a wire thereto, each pin being in press-fit contact with the layer of solderable material on the walls of the hole but being free of bonding

to the solderable material that plates the hole so the pin can be removed by forcing out without substantial damage to the walls of the hole;

each of said connection regions having at least one hole which holds one of said pinds and at least one other hole which is devoid of a pin to enable a lead to be soldered therein.

4,394,712

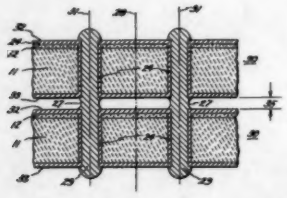
ALIGNMENT-ENHANCING FEED-THROUGH CONDUCTORS FOR STACKABLE SILICON-ON-SAPPHIRE WAFERS

Thomas R. Anthony, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 18, 1981, Ser. No. 244,854

Int. Cl.³ H05K 1/14

U.S. Cl. 361—411 **8 Claims**



1. An article of manufacture comprising in combination:

(a) a plurality of bodies, said bodies being disposed in an array, each said body being adjacent to a next body with a relatively uniform gap therebetween, each said body having top and bottom major opposed surfaces substantially parallel to each other and an outer peripheral edge area interconnecting said major surfaces, said array having an array axis, said array axis being substantially perpendicular to the major surfaces of each body of said array; and

(b) means for electrically interconnecting said bodies, said means

(i) having a substantially circular cross section,

(ii) having a plurality of materials of construction, said materials being arranged about said cross section in the region between said top and bottom surfaces as a first core material, a second material circularly encompassing said core material and a third outermost material circularly encompassing said first and second materials, the material of said cross section in said gap being substantially said first core material;

(iii) extending through and between each said body in said array,

(iv) having a means axis, said means axis being substantially parallel to said array axis, and

(v) being arranged in a substantially periodic means array, said means array having a means axis-to-means axis spacing substantially equal to twice the diameter of said cross section.

4,394,713

SELF-SUPPORTING CAPACITOR CASING HAVING A PAIR OF TERMINAL PLATES SANDWICHING AN INSULATIVE BODY FOR ALIGNING TERMINAL POSITIONS

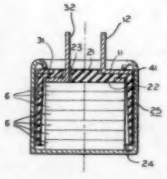
Kazunori Yoshida, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1980, Ser. No. 213,585

Claims priority, application Japan, Dec. 7, 1979, 54-169518[U]

Int. Cl.³ B01J 17/00; H01G 9/00

U.S. Cl. 361—433 **10 Claims**



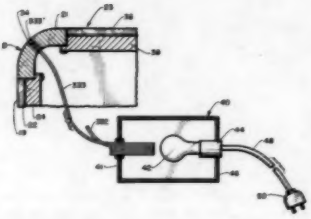
1. A self-supporting double-layer electrical capacitor comprising a conductive case having a bottom portion, an open end portion, and a side wall portion extending therebetween; a laminated capacitor body having a plurality of double-layer electrical capacitor cells disposed within said conductive case and having opposed first and second electrodes substantially parallel to each other, said first electrode facing the inner bottom portion of said conductive case and being electrically connected thereto; a first terminal plate disposed on said second electrode and being electrically connected thereto, said first terminal plate having a first elongated terminal portion which is substantially perpendicular to a principal surface of said first terminal plate and supported away from said side wall of said conductive case, said first elongated terminal portion extending toward said open end portion and set away from a center axis of said conductive case; insulating means for electrically isolating said first terminal plate and said laminated capacitor body from the side wall portion of said conductive case; an insulative body disposed on said first terminal plate and having an opening for said first elongated terminal portion to pass through; and a second terminal plate disposed on said insulative body and having an opening for said first elongated terminal portion to pass through, said second terminal plate having a second elongated terminal portion substantially perpendicular to a principal surface thereof and supported away from said side wall of said conductive case, said second elongated terminal portion extending toward said open end portion and set away from the center axis of said conductive case, said second terminal plate and said insulative body having complimentary contours for positioning said second terminal plate so that said first elongated terminal portion passing through the opening of said insulative body is electrically isolated from said second terminal plate, said open end portion of said conductive case being caulked onto a periphery of said second terminal plate for making an electrical connection thereto, said caulking pressing said second terminal plate toward the bottom of said conductive case, whereby electrical connections are achieved entirely by a mechanical pressure.

4,394,714

STEP LIGHTING SYSTEM

James Rote, 9523 Bullion Way, Orangevale, Calif. 95662

Filed Mar. 6, 1981, Ser. No. 241,046
Int. Cl.³ F21V 7/04; F21S 1/14
U.S. Cl. 362—32 12 Claims



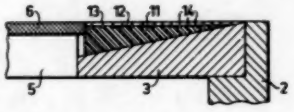
1. A lighting system for stairs comprising:
(a) A light panel adapted for disposition in or proximate one or more steps, said panel comprising an elongated section having a plurality of fibre optic rod receiving apertures therein along the length of said panel,
(b) a plurality of fibre optic cables, corresponding to the number of apertures with each of said apertures having an end of a cable therein,
(c) a light source, comprising a source of light disposal within a housing connected to a power source,
(d) a light grid, comprising areas adapted to receive all of said cables other ends and to dispose same toward said light source said light panel being disposed in the nose of the step to light the nose thereof, or within the balustrade to light the balustrade.

4,394,715

PROTECTIVE DEVICE FOR A GROUND-DEPOSITED LIGHT

Anders Dahlberg, Täby, Sweden, assignor to Tatis Plasttatnigar AB, Täby, Sweden

PCT No. PCT/SE79/00070, § 371 Date Nov. 30, 1979, § 102(e) Date Nov. 28, 1979, PCT Pub. No. WO79/00849, PCT Pub. Date Nov. 1, 1979
PCT Filed Mar. 28, 1979, Ser. No. 177,535
Claims priority, application Sweden, Mar. 30, 1978, 7803611
Int. Cl.³ F21S 1/02
U.S. Cl. 362—153 20 Claims



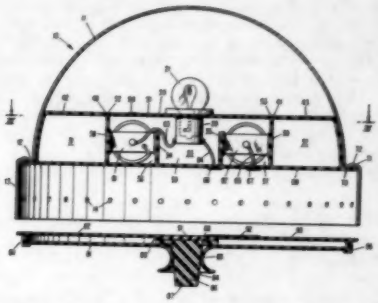
1. A protective device for a ground-deposited light comprising:
a housing;
a light source located in said housing, said housing having at least one opening therein for letting light out of said housing;
transparent sealing materials for sealing said opening; and,
granular particles that are harder than said transparent sealing material, said granular particles being partly embedded in said transparent sealing material and partly protruding above the surface thereof for protecting said transparent sealing material against abrasion.

4,394,716

SELF-CONTAINED UNDERWATER LIGHT ASSEMBLY

Thomas G. Campagna; Alfred A. D'Andrea, Sr., both of Selden, and Frank Campagna, East Northport, all of N.Y., assignors to Aqualume, Incorporated, Selden, N.Y.

Filed Jan. 13, 1981, Ser. No. 224,676
Int. Cl.³ F21L 11/00
U.S. Cl. 362—158 14 Claims



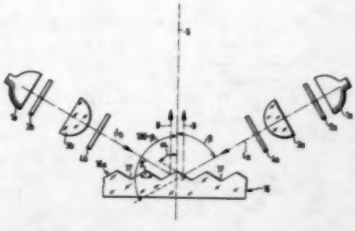
1. A self-contained underwater light assembly comprising,
(a) transparent shell means;
(b) lamp socket means;
(c) compartment means detachably secured within and against the transparent shell means for housing a power assembly means, weights and the lamp socket means;
(d) means for detachably securing the compartment means within and against the transparent shell means;
(e) power assembly means secured within the compartment means for securing a source of current within the compartment means and for supplying current to the lamp socket means;
(f) detachable seal means for sealing the compartment means within an area of the transparent shell means; and
(g) means for switching on and off the current supplied to the lamp socket means by the power assembly means when a source of current is installed in the power assembly means.

4,394,717

ILLUMINATION SYSTEM FOR COPYING APPARATUS

Malcolm G. Brockwell, Ilford, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Jan. 25, 1982, Ser. No. 342,616
Claims priority, application United Kingdom, Feb. 2, 1981, 8103075; Apr. 15, 1981, 8111884
Int. Cl.³ F21V 7/00
U.S. Cl. 362—247 7 Claims



1. An illumination system for a photographic copying apparatus for mixing light from two sources (*1a*, *1b*), which illumination system comprises disposed along a longitudinal optical

axis (5) a light-mixing mirror (16) which has as the light-mixing face (16*a*) a generally sulcated face having grooves (17) therein of triangular cross-section and raised portions of triangular cross-section separating the grooves such that alternate facets (17*a*, 17*b*) are parallel, said two light sources (1*a*, 1*b*) being diametrically opposed relative to the longitudinal axis (5) and located below the sulcated face (16*a*) and each being adapted to direct light onto said light-mixing mirror (1*b*) from an angle (β) relative to said longitudinal axis (5) which is twice the complement of the angle (α) made by one of the sets of said parallel facets (17*a*, 17*b*) relative to the longitudinal axis (5), the general plane of the sulcated face (16*a*) of the light-mixing mirror (16) being disposed normal to the said longitudinal axis and the grooves (17) therein having smooth polished reflecting surfaces (17*a*, 17*b*) and extending normal to a plane containing both light sources and the longitudinal axis (5), light from the two light sources striking the light-mixing mirror (16) and being reflected therefrom substantially along the longitudinal axis.

4,394,718

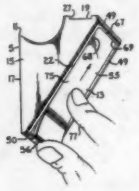
MOUNTING BRACKETS FOR HANDRAIL SYSTEM

Claude P. Balzer, Wichita, Kans., assignor to Balco, Inc., Wichita, Kans.

Continuation of Ser. No. 181,231, Aug. 24, 1980, Pat. No. 4,367,517. This application Mar. 22, 1982, Ser. No. 360,762

Int. Cl.³ F21V *19/04*

U.S. Cl. 362—278 **10 Claims**



1. A light emitting mounting bracket comprising:

(a) a body portion having a cavity projecting inwardly from one side thereof; said one side having a surface associated therewith;

(b) a slot defined at the juncture of said cavity and said surface;

(c) a light emitting source securely and removably retained in said cavity;

(d) electrical current means communicating with said light emitting source; and

(e) a resilient transparent lens wedgedly resiliently and removably received in said slot; said lens having an outer surface associated therewith; said lens surface mating with said body portion surface so as to be substantially flush therewith, thereby presenting a substantially clean profile.

4,394,719

CURRENT CONTROL APPARATUS FOR A FLYBACK CAPACITOR CHARGER

Gregory O. Moberg, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

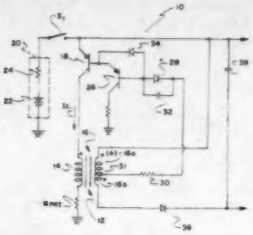
Filed Dec. 11, 1981, Ser. No. 329,855

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—18 **6 Claims**

1. In a DC to DC converter adapted to be energized by a power supply, the converter comprising a transformer including a primary winding and secondary winding, and switching means including a power transistor having a base electrode, the power transistor being coupled between the power supply and the primary winding for periodically interrupting the power supply current to cause current to flow in the secondary winding, the improvement comprising:

(a) a high gain, signal transistor having a base electrode, the signal transistor being coupled in emitter follower configuration to the base of the power transistor; and



(b) a diode and a feedback current limiting resistor connected in series between the secondary winding and the base of the signal transistor.

4,394,720

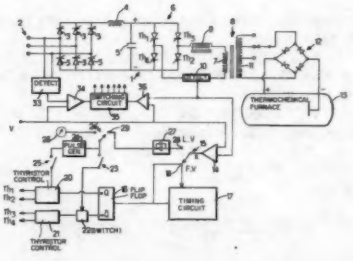
AUTO-STABILIZED HIGH POWER ELECTRIC GENERATOR ESPECIALLY ADAPTED FOR POWERING PROCESSES INVOLVING DISCHARGE IN A RAREFIED GASEOUS ATMOSPHERE

Gabriel Gabor, Petit-Beauregard, France, assignor to Jean Frager, Paris, France

Filed Dec. 10, 1980, Ser. No. 215,144

Int. Cl.³ H02M *5/438*

U.S. Cl. 363—37 **7 Claims**

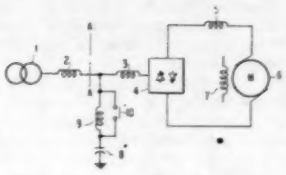


1. Auto-stabilized high power electric generator, especially adapted for powering a process involving a discharge into a rarified gaseous atmosphere, which comprises a controllable frequency oscillator connected to a rectifier circuit by a connection comprising, in series, an induction coil, a measuring device which furnishes a detected signal representing the current flowing between said oscillator and said rectifier, and a comparator comparing said signal with a reference signal, and which controls the frequency of said oscillator so as to cause an increase in frequency when said detected signal becomes greater than the reference signal, said oscillator being regulated by a switching device controlled, in the event the detected signal is less than the reference signal, by a timing device, and in the event the detected signal is higher than the reference signal, by the pulses delivered by said comparator.

4,394,721
THYRISTOR POWER CONVERTER WITH SWITCHED IMPEDANCE

Toshiaki Ishii, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1981, Ser. No. 272,849
Claims priority, application Japan, Nov. 4, 1980, 55/154985
Int. Cl.³ H02M 1/12
U.S. Cl. 363—44 6 Claims

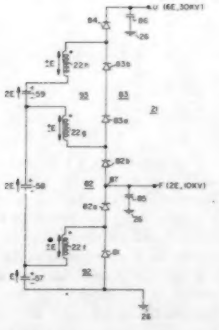


1. A thyristor power conversion apparatus for converting ac power to dc power by thyristor commutation, comprising:
(a) an ac power supply (1) having an internal reactance (2),
(b) thyristor means (4) for converting ac power to dc power, and having a reactance component (3) on an input side thereof,
(c) capacitor means (8) connected to said input side of said thyristor means,
(d) impedance element means (9) connected in series with said capacitor means,
(e) switching means (10) connected in parallel with said impedance means, and
(f) firing circuit means (11) for generating;
(1) firing signals to commutate said thyristor means, and
(2) switching signals to close said switching means only during the commutation of said thyristor means.

4,394,722
TELEVISION RECEIVER HIGH VOLTAGE GENERATOR

Leroy W. Nero, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 297,791
Int. Cl.³ H02M 7/10; H04N 3/18
U.S. Cl. 363—68 17 Claims

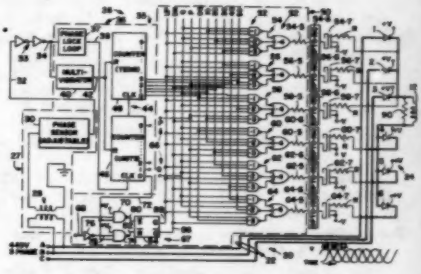


1. In a television display system having a picture tube that requires an ultor accelerating potential and an intermediate direct voltage, a high voltage generator for developing the two voltages, comprising:
a source of alternating voltage;
a transformer including a primary winding and first and second high voltage secondary windings, said primary winding being coupled to said source for developing an alternating polarity voltage across each of the two high voltage secondary windings;
an ultor terminal, an intermediate voltage terminal and a reference terminal;
a first voltage doubler coupled to said first high voltage winding for rectifying the alternating polarity voltage developed across said first high voltage winding during both polarity intervals thereof to produce a first direct voltage, said first direct voltage being applied to said intermediate voltage terminal to generate said picture tube intermediate direct voltage between said intermediate voltage terminal and said reference terminal; and
a second voltage doubler coupled to said second high voltage winding for rectifyig the alternating polarity voltage developed across said second high voltage winding during both polarity intervals thereof to produce a second direct voltage, said first and second direct voltages being combined and applied to said ultor terminal to generate said picture tube ultor accelerating potential between said ultor terminal and said reference terminal.

4,394,723
POWER SUPPLY CIRCUIT

John P. Hoffman, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00578, § 371 Date Apr. 30, 1981, § 102(e) Date Apr. 30, 1981, PCT Pub. No. WO82/03954, PCT Pub. Date Nov. 11, 1982
PCT Filed Apr. 30, 1981, Ser. No. 275,075
Int. Cl.³ H02P 13/24
U.S. Cl. 363—87 12 Claims

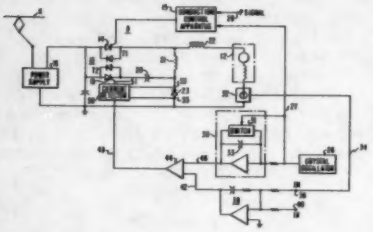


1. In a power supply circuit (20) having a load (12), means (22) for conducting current of a 3-phase AC source, and triggerable means (24) for coupling the current of the 3-phase AC source between said conducting means (22) and said load (12), the improvement comprising:
(a) means (27) for generating a reference signal in response to one reference phase voltage (AB) of the 3-phase AC source; and
(b) means (35) for triggering said triggerable means (24) at predetermined phase angles of the 3-phase AC source relative to the reference phase voltage (AB) and in response to the reference signal to control the current through said load (12), wherein said means (35) includes:
(i) means (36) for dividing a cycle of the one reference phase voltage (AB) into a plurality of phase angles and generating signals representing the plurality of phase angles;
(ii) a decoder logic network (52) being adapted to decode the signals representing the plurality of phase angles; and
(iii) means (67) for selectively activating said decoder logic network to decode the signals representing the phase angles to control the build-up or decay of the current through said load (12).

4,394,724
PROPULSION MOTOR CONTROL APPARATUS AND METHOD

Warren C. Fry, West Mifflin; James H. Franz, Murrysville, and Paul J. Merlino, West Newton, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 30, 1981, Ser. No. 316,698
Int. Cl.³ H02M *3/315*; H02P *5/16*
U.S. Cl. 363—124 **8 Claims**



1. In control apparatus for a load circuit operative with a power supply and including a member through which current passes, with said load circuit being responsive to a control pulse to determine the operation of said load circuit, the combination of

first switch means for coupling the control pulse to said load circuit when the first switch means is conductive,

second switch means responsive to current passing through said member and being made conductive in accordance with the passage of current through said member,

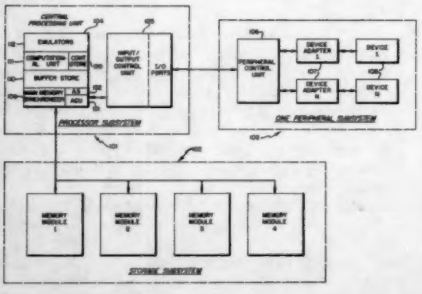
first signal means for applying said control pulse through the second switch means when the second switch means is conductive, and

second signal means coupled with the second switch means and controlling the conductivity of the first switch means when the second switch means is conductive.

4,394,725
APPARATUS AND METHOD FOR TRANSFERRING INFORMATION UNITS BETWEEN PROCESSES IN A MULTIPROCESSING SYSTEM

Jacques Bienvenu; Patrick Dufond, both of Paris; Claude Carre, la Varenne-St-Hilaire; Duc L. Tuong, Paris; Henri Verdier, Paris; Philippe-Hubert deRivet, Paris; John J. Bradley, Garches, all of France, and Benjamin S. Franklin, Cambridge, Mass., assignors to Compagnie Honeywell Bull, France

Continuation of Ser. No. 529,015, Dec. 2, 1974, abandoned. This application Dec. 4, 1978, Ser. No. 966,371
Claims priority, application France, Nov. 30, 1973, 73 42711
Int. Cl.³ G06F *9/00*
U.S. Cl. 364—200 **14 Claims**



1. In a data processing system wherein a data element is held in a memory member of said system, wherein said memory member holds one of a first queue of representations of processes awaiting information units not available when required by said processes and a second queue of representations of information units available to processes and not required by other processes, wherein said data element operatively associates related ones of said first and second queues with each other, said data element including a field representing the one of said queues present in said memory member, and wherein said system during the execution of a first process executes an instruction of a particular class for transferring an information unit between said first process and a second process, an apparatus for controlling transfer of information units between said first and second processes, comprising:

retrieving means controlled by said instruction for retrieving said data element from said memory member;

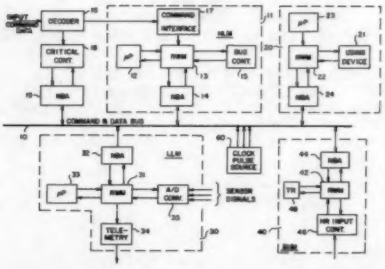
testing means for testing said field of said data element retrieved from said memory member and for generating a first signal when said field represents the presence of said first queue and a second signal when said field represents the presence of said second queue; and

control means controlled by said instruction and selectively responsive to said first and second signals for processing the one of said queues present in said memory member to enable the transfer of an information unit between said first and second processes.

4,394,726
DISTRIBUTED MULTIPORT MEMORY ARCHITECTURE

Wayne H. Kohl, LaCrescenta, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 29, 1981, Ser. No. 258,623
Int. Cl.³ G06F *9/22, 13/00*
U.S. Cl. 364—200 **9 Claims**



1. In a distributed data processing system having a plurality of independent centers connected to a bus for performing tasks, and having a source of system clock pulses applied to all centers, each task center being comprised of a memory and a plurality of devices using said memory, one of said devices in each center being a bus adapter coupling said bus to said memory, and one of said devices in one of said centers being a bus controller for control of the transfer of data between task centers, a separate multiport memory architecture for said memory of each task center comprising logic means responsive to said clock pulses for synchronous timing and control of direct access to said memory by devices of the task center, including said bus adapter, a separate device being given access during each of NX clock pulse periods in a predetermined sequence, with selected devices being given access more than once in a sequence, where N is the fixed number of bits in a word to be serially transferred on said bus between centers and X is an integer selected for each task center to satisfy particular

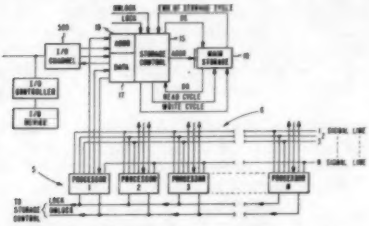
needs of the task center, whereby all devices of a task center are given memory access at least once during NX clock pulse intervals.

4,394,727

MULTI-PROCESSOR TASK DISPATCHING APPARATUS

Roy L. Hoffman, Pine Island; Merle E. Houdek, Rochester; Larry W. Loen, Rochester, and Frank G. Soltis, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 4, 1981, Ser. No. 260,543
Int. Cl.³ G06F *9/46*
U.S. Cl. 364—200 **6 Claims**



1. Tasking apparatus for a multiprocessor computer system including at least two processors sharing a common main storage containing a task dispatching queue adapted to have task dispatching elements enqueued in priority sequence, each processor having a task dispatcher for dispatching task dispatching elements from said task dispatching queue and for performing task switches when its associated processor is processing a task dispatching element having a priority lower than the priority of a waiting dispatchable task dispatching element on said task dispatching queue, said processors each having an enqueueing mechanism for returning waiting non-dispatchable task dispatching elements to said task dispatching queue, the improvement comprising:

a signal dispatcher for each processor for scanning the priorities of task dispatching elements on said task dispatching queue and signaling another processor to operate its task dispatcher upon finding a task dispatching element on said task dispatching queue having a priority higher than the priority of the task dispatching element being processed by the processor to be signaled, said signal dispatcher being rendered operable in response to said enqueueing mechanism of the associated processor enqueueing a task dispatching element on said task dispatching queue.

4,394,728

ALLOCATION CONTROLLER PROVIDING FOR ACCESS OF MULTIPLE COMMON RESOURCES BY A DUPLEX PLURALITY OF CENTRAL PROCESSING UNITS

Joseph A. Comfort; Thomas J. Perry, and Michel Loos, all of Phoenix, Ariz., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Jun. 26, 1980, Ser. No. 163,047
Int. Cl.³ G06F *13/00, 13/06*
U.S. Cl. 364—200 **19 Claims**

1. An allocation controller providing for equal priority sharing of multiple duplicate copy resources by active ones of duplicated pairs of a plurality of, CPUs said allocation controller comprising:

said plurality of CPUs including first, second and third groups each group including first and second portions;

at least three resources each having two duplicate copies, each to be selectively connected to any CPU of said plurality;

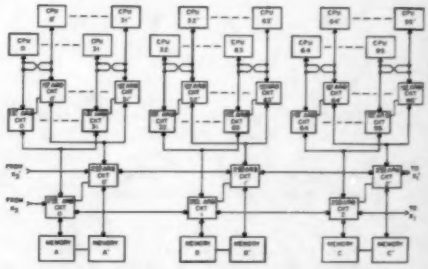
first arbitration means including first, second and third duplicated groups, each duplicated group of first arbitration means connected to a corresponding group of CPUs;

said first arbitration means operated in response to resource request signals from said plurality of CPUs to provide for selection of one CPU per CPU group;

a plurality of CPU buses including first, second and third groups corresponding to said CPU groups, each bus connected between a particular CPU and said first arbitration means, each CPU bus including a control portion and an address/data portion;

at least three pair of group buses, each bus pair corresponding to one said CPU group and said corresponding CPU buses, and each group bus connected between a particular CPU through said corresponding CPU bus via said first arbitration means and connected to one copy of said duplicate copy resources via one said group bus, each group bus further connected to said other group buses of said corresponding groups;

one group bus of each said pair further connected to a first copy of said duplicate copy resources and another group



bus of each said pair further connected to a second copy of said duplicate copy resources;

second arbitration means connected between each of said duplicate copy resources and each group of first arbitration means and said second arbitration means operated in response to said operation of said first arbitration means to select one of said requesting CPUs of said different CPU groups for connection to said first and said second copies of one selected duplicate copy resource via one said pair of group buses and said corresponding CPU buses;

said group bus pair connected to said requesting CPU via said corresponding CPU bus through said first arbitration means and said second arbitration means and connected to said duplicate copy resources to establish bus connection between said one selected CPU and said selected duplicate copy resources for the transmission of data to and from said resources; and

each of said second arbitration circuits operated on a rotational basis to allocate access of said selected duplicate copy resources to said requesting CPU.

4,394,729

JUMP RETURN STACK

Rolfe D. Armstrong, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

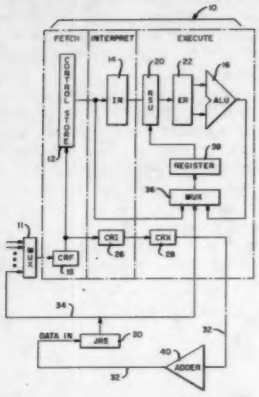
Filed Oct. 16, 1980, Ser. No. 197,417
Int. Cl.³ G06F *9/42*
U.S. Cl. 364—200 **9 Claims**

1. In a data processor comprising control store means to store instructions at specific addresses, fetch control register means connected thereto to control the operation thereof, execution means to process information fetched from the addresses in controllable sequence, jump return stack means comprising:

storage means for storing a plurality of jump return addresses in order;

counter means connected to said storage means for addressing said storage means; and

register means connected to said storage means to supply address information thereto and separately connected to said execution means and separately connected to said



fetch control register means for storing the latest jump return address inputted to said jump return stack means, to make the latest jump return address available to said fetch control register means independently of receiving a jump return address directly from the storage means.

4,394,730

MULTI-PROCESSOR SYSTEM EMPLOYING JOB-SWAPPING BETWEEN DIFFERENT PRIORITY PROCESSORS

Seigo Suzuki, Yokohama, and Seiji Eguchi, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

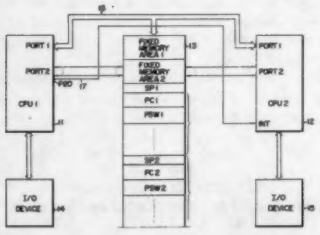
Continuation-in-part of Ser. No. 120,400, Feb. 11, 1980, abandoned, which is a continuation of Ser. No. 747,347, Dec. 3, 1976, abandoned. This application Oct. 16, 1980, Ser. No. 197,566

Claims priority, application Japan, Dec. 4, 1975, 50-144630

The portion of the term of this patent subsequent to Mar. 2, 1999, has been disclaimed.

Int. Cl.³ G06F *9/46, 15/16*

U.S. Cl. 364—200 **3 Claims**



1. A multi-processor system coupled to an external I/O device, said multi-processor system comprising:

(a) an external memory;

(b) a high priority processor initially executing a first stored program and connected by a data bus to said external memory, said high priority processor including:

(i) a first internal memory containing linkage information, including program status data and instructions, for the program being executed by said high priority processor,

(ii) first program control means coupled to said first internal memory for directing the transfer of said linkage information between said first internal memory and said external memory via said data bus,

(iii) an instruction register and decoder which receives an interrupt signal from said I/O device and which causes said program control means to direct the transfer of said linkage information corresponding to said first stored program into said external memory, and

(iv) means coupled to said instruction register and decoder for generating a swap interrupt signal after said linkage information is stored in said external memory and for causing said high priority processor to execute a program supplied by said I/O device; and

(c) a low priority processor initially executing a second stored program and connected by said data bus to said external memory, said low priority processor including:

(i) a second internal memory containing linkage information, including program status data and instructions, for the program being executed by said low priority processor,

(ii) second program control means coupled to said second internal memory for directing the transfer of said linkage information between said second internal memory and said external memory via said data bus,

(iii) a control and timing circuit responsive to said swap interrupt signal from said high priority processor for causing said second program control means to direct the storage of said linkage information corresponding to said second stored programming into said external memory and to direct the retrieval of said linkage information corresponding to said first stored program from said external memory into said second internal memory of said low priority processor, thereby causing said low priority processor to execute said first stored program.

4,394,731

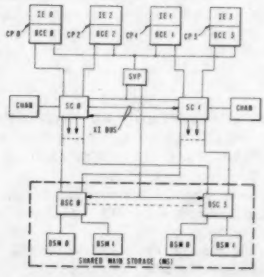
CACHE STORAGE LINE SHAREABILITY CONTROL FOR A MULTIPROCESSOR SYSTEM

Frederick O. Flusche; Richard N. Gustafson, both of Hyde Park, and Bruce L. McGilvray, Pleasant Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,500

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **16 Claims**



1. A multiprocessor (MP) system having at least two processors, in which each processor has a processor store-in-cache, and a processor cache directory (PD) with a plurality of line entries for corresponding line positions in the associated cache, the MP system further comprising,

each processor requesting its PD for main storage access with either an exclusive (EX) or readonly (RO) shareability signal,

an exclusive (EX) bit position, a line change (CH) bit position, a valid (V) bit position, and an address field being

provided in each PD line entry, the opposite states of the EX bit position indicating exclusive or readonly shareability for the corresponding line position,

cache miss detecting means connected to each PD for generating a storage line fetch and cross-interrogation (XI) command from each cache miss, the XI command indicating if the initiating processor request has an exclusive or readonly signal and is a fetch or store request and indicating a main storage address for the request,

cross-interrogation (XI) means connected to receive each XI command,

control means connected to receive the output of the XI means and searching valid line entries represented in each other PD in the MP system for detecting any existing conflicting line having the main storage address indicated in the XI command,

testing means associated with each PD and connected to receive each XI command for testing the state of the EX bit position in any entry found to represent a conflicting line, and if the EX bit is set to the exclusive state also testing the CH bit for the conflicting line,

means connected to each cache for casting out any conflicting line from the associated cache if the testing means senses the CH bit is on, and setting off the V bit position in the associated PD entry for the conflicting line,

means in the associated PD for the conflicting line for setting the EX bit position to the readonly state if the CH bit position is off and not casting out the line which then remains valid in its processor cache,

inter-cache means connected between the processors in the MP for setting an EX bit position to readonly state in a line entry for the storage line fetch in the PD which generated the XI command when the EX bit position in each entry for the conflicting line is set to readonly state,

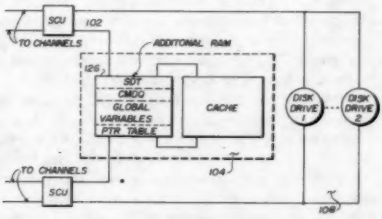
whereby readonly cache sharing is permitted for the line obtained by the storage line fetch found to have a conflicting line in another cache in a non-changed state, even though the initiating processor request is for exclusive control of the requested data.

4,394,732

CACHE/DISK SUBSYSTEM TRICKLE

Robert E. Swenson, Mendota Heights, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 14, 1980, Ser. No. 207,097
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **10 Claims**



1. In a data processing system including a disk drive device for driving a disk, a host processor for issuing commands calling for the transfer of data between said host processor and said disk drive device, a cache store for storing segments of data, and a storage control unit connected between said host processor, said cache store and said disk drive device for controlling transfers of data between said host processor, said cache store and said disk drive device in response to said command, the improvement comprising:

storage means for storing a command queue and a segment descriptor table,

said table having an entry therein corresponding to each segment of data in said cache store, each of said entries including a written-to bit which is set if the corresponding segment has been written to while resident in said cache store;

said command queue comprising a series of commands issued by said host processor to said storage control unit and waiting to be executed by said storage control unit to transfer data between said host processor and said disk drive device through said storage control unit;

said storage control unit including,

first means connected to said storage means for searching said segment descriptor table for an entry wherein said written-to bit is set.

second means, responsive to said first means when said first means locates an entry wherein said written-to bit is set, for forming a command directing the transfer of the segment of data corresponding to said located entry from said cache store to said disk drive device,

third means for entering said formed command into said command queue; and

means responsive to said command queue for executing said formed command when said disk drive device is not busy,

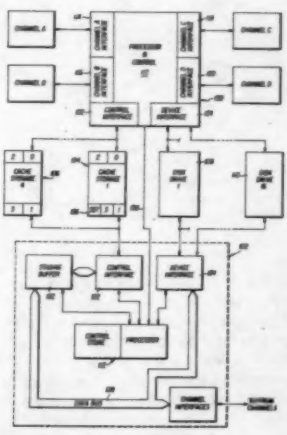
whereby the transfer of said written-to segment from said cache store to said disk drive device is accomplished without intervention by said host processor.

4,394,733

CACHE/DISK SUBSYSTEM

Robert E. Swenson, Mendota Heights, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 14, 1980, Ser. No. 207,152
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **15 Claims**



1. A data processing system comprising:

a disk drive device for driving a data storage disk;

a host processor for issuing commands defining an operation to be performed and the address of disk space at which said operation is to be performed,

said address specifying the starting address and a number of words of said disk space;

a cache store for storing segments of data;

means for storing a segment descriptor table, said segment descriptor table having an entry corresponding to each segment of data residing in said cache store;

a storage control unit interfacing with said host processor, said disk drive device, said means for storing a segment descriptor table and said cache store;

means in said storage control unit responsive to a command from said host processor calling for a read from said disk for accessing said segment descriptor table to produce a

miss signal if a copy of the data from the disk space specified by said command is not resident in said cache store;

means responsive to said miss signal for transferring from said disk space to said cache store the data from the specified disk space which is not resident in said cache store; and

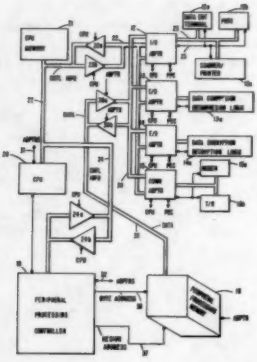
means in said storage control unit for controlling the transfer of the data at said specified disk space to said host processor;

whereby said host processor may read from said disk any variable number of words of data as specified by said address.

4,394,734
PROGRAMMABLE PERIPHERAL PROCESSING CONTROLLER

Kent S. Norgren, Longmont, and Robert E. Vogelsberg, Boulder, both of Colo., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,636
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **11 Claims**



1. In a peripheral processing system having a central processor for supervising the system, a plurality of peripheral devices, a peripheral memory, said devices for processing data with the peripheral memory independent of the central processor, control apparatus for controlling access of the peripheral devices to the peripheral memory comprising:

a plurality of memory address registers, each register selected by one of the peripheral devices,

a plurality of mode registers, each mode register selected by one of the peripheral devices,

said memory address registers being initialized to a starting address by said central processor;

said mode registers being initialized to one of a plurality of end-of-block modes by said central processor, each mode defining an end-of-block condition for a block of memory space;

means for accessing the peripheral memory with an access address corresponding to the starting address from the memory address register selected by a peripheral device, said accessing means advancing said access address to access memory space as said selecting peripheral device processes data;

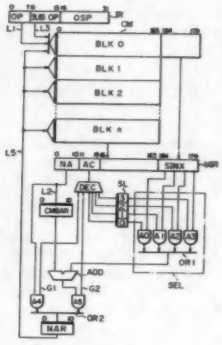
end-of-block detection means, responsive to the mode in said selected mode register, for detecting when said access address has reached the end-of-block condition defined by the mode in said selected mode register;

means, responsive to the end-of-block condition detected by said detecting means, for inhibiting said accessing means whereby the mode in said selected mode register controls when the selecting peripheral device has completed access to a block of memory space.

4,394,735
DATA PROCESSOR CONTROLLED BY MICROPROGRAMS

Kiyosumi Satoh, and Nobuyuki Watanabe, both of Kawasaki, Japan, assignors to A. Aoki & Associates, Tokyo, Japan

PCT No. PCT/JP80/00167, § 371 Date Mar. 25, 1981, § 102(e) Date Mar. 20, 1981, PCT Pub. No. WO81/00315, PCT Pub. Date Feb. 5, 1981
PCT Filed Jul. 23, 1980, Ser. No. 245,645
Claims priority, application Japan, Jul. 25, 1979, 54-94504
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—200 **19 Claims**



1. A data processor controlled by microprograms, comprising:

an instruction register for storing a machine instruction having a suboperation code and an operation code;

a control memory, operatively connected to said instruction register, for storing a first micro-instruction having next address data and address control data and a second micro-instruction having suboperation index data units;

a micro-instruction register, operatively connected to said control memory, for temporarily storing the first micro-instruction read out in a first access of said control memory by using the operation code of the machine instruction stored in the instruction register, and the suboperation index data units contained in the second micro-instruction read out in a second access of the control memory by using the suboperation code of said machine instruction;

a selector operatively connected to said micro-instruction register; and

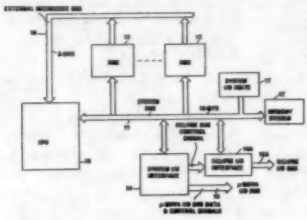
means, operatively connected to said micro-instruction register, said selector and said control memory, for logical operation;

each of said first micro-instructions are stored in the control memory and read out by using said operation code, said selector selecting one of said suboperation index data units according to said address control data, a third access to said control memory being performed by using combined next address data obtained by the logical operation between said next address data and the selected suboperation index data unit using said means for logical operation.

4,394,736
DATA PROCESSING SYSTEM UTILIZING A UNIQUE TWO-LEVEL MICROCODING TECHNIQUE FOR FORMING MICROINSTRUCTIONS

David H. Bernstein, Ashland, Mass.; Richard A. Carberry, Cupertino, Calif.; Michael B. Druke, Chelmsford, and Ronald I. Gusowski, Westboro, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Feb. 11, 1980, Ser. No. 120,272
Int. Cl.³ G06F *9/22*
U.S. Cl. 364—200 10 Claims



1. In a data processing system requiring the generation of microinstructions for performing data processing operations and including a

a central processor unit having means responsive to macroinstructions for providing decoded macroinstructions for use in generating one or more microinstructions, said central processor unit further including

first control store means for providing one or more microinstructions in response to identification signals, one or more selected fields of each of said microinstructions being capable of modification;

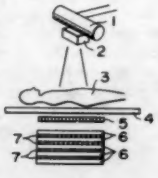
second control store means for providing a plurality of microinstruction portions, one or more of said second plurality of microinstruction portions providing modifier fields containing information usable for modifying said one or more selected fields of said one or more microinstructions, said second control store means being responsive to a said decoded macroinstruction for producing said plurality of microinstruction portions; and

modification means responsive to said one or more microinstructions provided by said first control store means and to the modifier fields of said one or more microinstruction portions provided by said second control store means for providing modified microinstructions for performing said data processing operation.

4,394,737
METHOD OF PROCESSING RADIOGRAPHIC IMAGE

Takao Komaki, and Seiji Matsumoto, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 11, 1980, Ser. No. 168,802
Claims priority, application Japan, Jul. 11, 1979, 54-87793; Jul. 11, 1979, 54-87796; Jul. 11, 1979, 54-87797
Int. Cl.³ G06F *15/42*
U.S. Cl. 364—414 13 Claims

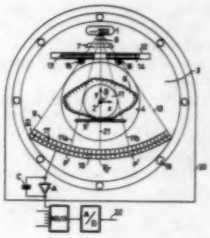


1. In radiographic image recording system, a method of processing a radiographic image comprising steps of recording radiographic images of an object viewed from the same direction on a plurality of radiographic films, superposing and averaging the images on the plurality of radiographic films to obtain an averaged image having averaged density, and enhancing the gradient of gradation of the averaged image.

4,394,738
METHOD OF AND DEVICE FOR DETERMINING THE DISTRIBUTION OF RADIATION ABSORPTION IN A SLICE OF A BODY

Wolfgang Wagner, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,478
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1979, 2924423
Int. Cl.³ A61B *6/00*; G01N *23/00*
U.S. Cl. 364—414 7 Claims



1. A method for determining the distribution of radiation absoption properties in a body by computed tomography which includes the steps of:

radiating a planar examination zone in the body, from a plurality of directions, with radiation having a first intensity so that the radiation passes through the examination zone along a large number of measurement paths in the plane of the examination zone, collimating said radiation so that the radiation having a first intensity does not pass through the body along paths which do not pass through the examination zone, and measuring the intensity of the radiation which has passed through the examination zone along the paths to obtain as a first set of measurement values;

radiating a positioning zone, which lies in the plane of and completely encloses the examination zone, from a plurality of directions with radiation having a second intensity which is smaller than the first intensity, so that the radiation passes through the positioning zone along a large number of measurement paths in the plane of the zones, and measuring the intensity of the radiation which has passed through the positioning zone to obtain a second set of measurement values;

calculating first absorption values from the first set of measurement values;

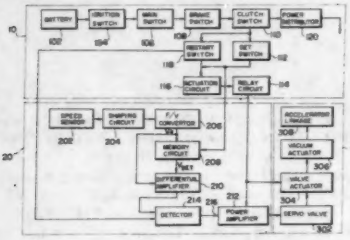
calculating second absorption values from the second set of measurement values; and

reconstructing the distribution of radiation absorption properties in the examination zone from using the first absorption values and the second absorption values.

4,394,739
AUTOMATIC SPEED CONTROL SYSTEM FOR AN AUTOMOTIVE VEHICLE

Kouichi Suzuki, and Kazuyuki Mori, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 12, 1981, Ser. No. 224,196
Claims priority, application Japan, Jan. 14, 1980, 55-2140
Int. Cl.³ B60K *31/00*
U.S. Cl. 364—426 **22 Claims**



1. An automatic speed control system for an automotive vehicle which adjusts the vehicle speed to a pre-set constant speed, comprising:

a first means for setting the vehicle speed at a desired value and comparing said set speed with the actual vehicle speed to obtain the difference therebetween, said first means generating a control signal corresponding to the determined difference;

a second means for controlling an accelerator of the vehicle in response to said control signal in a control mode of the control system to reduce the difference between the set speed and the actual speed to zero;

a third means connected to disable application of said control signal to said second means for interrupting the operation of the control system;

a fourth means comprising a resume means, said fourth means connected for enabling application of said control signal to said second means, activated for returning the control system to operation after interruption of the operation thereof and for returning the vehicle speed to said set speed; and

a fifth means connected to said fourth means for inhibiting the control system from entering into the control mode when said fourth means is activated until said fourth means is deactivated thereafter, thereby delaying the response of said second means to the operation of said fourth means to return the vehicle speed to said set speed until said fourth means is again deactivated,

whereby erroneous operation of said second means due to a faulty resume means is prevented.

4,394,740
COMPUTER ADAPTED APPARATUS AND METHOD FOR PRICING LENGTHS OF MATERIAL

Tadmor Shalon, St. Louis, Mo., assignor to The Measuregraph Company, St. Louis, Mo.

Filed Mar. 16, 1981, Ser. No. 244,268
Int. Cl.³ G06F *15/20;* **G01B** *3/12*
U.S. Cl. 364—464 **14 Claims**

1. A processor controlled apparatus for measuring and pricing lengths of material such as fabric, or the like, comprising:

(a) a base structure having a horizontal throat for passage therethrough of a margin of the material to be measured and below said throat a measuring roller adapted for rotation;

(b) a pressure roller adapted for rotation around an axis above and parallel to the axis about which said measuring roller rotates;

(c) a resiliently loaded pressure roller support structure mounted on said base structure and being movable between an elevated position for insertion and removal of said material and a lowered position in which said pressure roller resiliently engages said measuring roller enabling said material to be pulled through said throat and thereby rotate both said rollers;

(d) releasable latching means carried by said base structure and adapted for releasably latching said pressure roller support structure when raised to said elevated position;

(e) means for notching said material after a desired number of uniform units of length have been drawn through said rollers to indicate the length so drawn, comprising:

(i) a fixed blade positioned below the plane of the material being measured and proximate said throat;

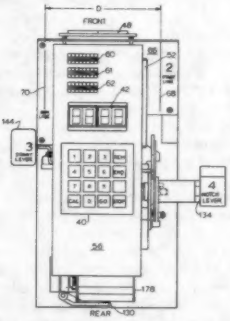
(ii) a movable shear blade adapted for movement in a vertical plane and cooperable for notching said material on the margin thereof;

(iii) manual notch operator means for moving said movable blade downwardly to notch said fabric; and

(iv) means biasing said movable blade and manual latch operator means to a raised position wherein said movable blade is out of engagement with said fixed blade;

(f) a mechanical lock-out mechanism operable in response to operation of said notch operator means during notching of said fabric and including:

(i) disable means for blocking notching motion of said notch operator means and movable between disable and enable positions;



(ii) rotative means driven by said measuring roller and adapted for being locked in a single rotative home position corresponding to said measuring roller being in a position corresponding to some predetermined uniform unit of measure whereby to lock said measuring roller in such home position; and

(iii) cooperatively associated positionable members mounted on said base structure and being adapted in response to movement of said notch operator means for mechanically sensing said home position and dependent upon said rotative means being in said home position for locking said rotative means and thereby locking said measuring roller in said home position, moving said disable means to its said enable position enabling said notch operator means to move through the notching motion and raising said pressure roller to its said elevated position for latching by said latching means;

(g) manual latch operator release means adapted to unlatch said pressure roller support structure latching means to allow said pressure roller to return to said lowered position;

(h) manual operator reset means including means operative on said measuring roller rotative means for restoring said rotative means and thereby restoring said measuring roller to said home position when rotatively offset therefrom; and

(i) processor means mounted on said base structure including:

(i) optical encoder and electronic signal processing means operable in response to rotation of said measuring roller for each predetermined unit of measure for developing and storing a signal count corresponding to the total of such units measured and from such count developing and displaying with electronic digital light display means controlled by said count the length so measured;

(ii) a keyboard and storage means for entering and storing unit price, operator and product code information and displaying with electronic digital alpha-numeric light display means associated therewith the entry of such information;

(iii) computation means for utilizing said count and unit price and developing therefrom, storing and displaying a total price; and

(iv) a ticket printer having character forming and ticket advancing means under program control included in said processor means for printing said unit price, length, total price, operator and product code on a ticket in alpha-numeric form; and

(j) a switch adapted to disable said optional encoder means in response to raising of said pressure roller to said elevated position.

4,394,741

BATTERY MONITORING SYSTEM

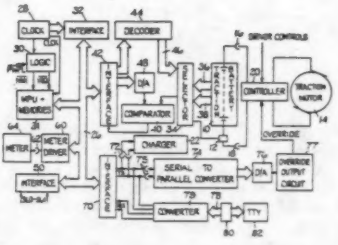
Michael W. Lowndes, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Nov. 18, 1980, Ser. No. 208,109

Claims priority, application United Kingdom, Jun. 28, 1980, 8021285

Int. Cl.³ H02J 7/00; G06F 15/56

U.S. Cl. 364—483 **9 Claims**



1. A battery state of charge evaluator comprising:

means responsive to battery voltage for producing a voltage value,

means responsive to battery current for producing a current value,

means for computing the polarization voltage as a complex function of time and of the current value, the complex function being determined in accordance with characteristics of the battery being evaluated,

means for correcting the voltage value to compensate for the polarization voltage, and

means for computing the state of charge of the battery as a function of the corrected voltage value, said function being determined in accordance with the characteristics of the battery being evaluated.

4,394,742

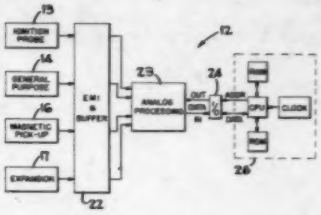
ENGINE GENERATED WAVEFORM ANALYZER

Marvin R. Crummer, Tustin; Kenneth S. Gold, Canoga Park; David G. Johnson, Newhall; Tom R. Vandermeyden, Norwalk, and Edmond R. Pelta, Los Altos Hills, all of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Oct. 31, 1980, Ser. No. 202,516

Int. Cl.³ G01M 15/00

U.S. Cl. 364—487 **29 Claims**



1. An internal combustion engine wave characteristic analyzer for a two dimensional wave signal representative of an operating characteristic of the engine wherein predetermined wave characteristic data are held in storage, comprising means for receiving the wave signal and for providing a plurality of sampled output signals corresponding to wave characteristics at a plurality of positions along the length of the wave, means for receiving and storing data indicative of said plurality of output signals, means for continuously performing analysis of ones of said plurality of output signal data utilizing others of said plurality of output signal data and ones of said predetermined wave characteristic data, thereby providing a discrete analysis signal, means for continuously receiving and diagnosing the engine operating characteristic in view of said discrete analysis signal and for providing a diagnostic signal for the engine operating characteristic responsive thereto, means coupled to said diagnostic signal for providing an instruction output relating to operations required to retain and reestablish the predetermined wave characteristic, and means for alphanumerically displaying said instruction output.

4,394,743

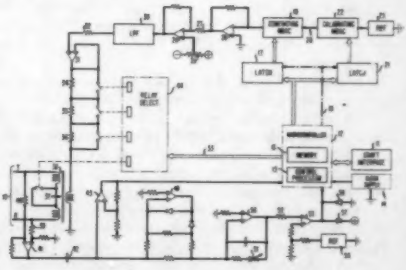
TONE GENERATION METHOD AND APPARATUS USING STORED REFERENCE CALIBRATION COEFFICIENTS

Paul A. Mercer, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 18, 1980, Ser. No. 217,678

Int. Cl.³ G10H 5/10; H04M 1/50

U.S. Cl. 364—514 **18 Claims**



1. A tone signal generator including a source (16) of selectable sets of digital coefficient signals defining a predetermined

analog signal waveform, and means (19) for multiplying said coefficient signals by a reference signal for producing an analog tone signal which is recurrent at a predetermined rate, the generator comprising

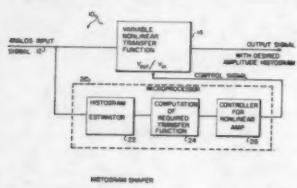
means (53, 13) for feeding back the output of said generator to control the magnitude of said reference signal for establishing a predetermined generator output tone amplitude.

4,394,744

REAL-TIME AMPLITUDE HISTOGRAM SHAPER

Edwin H. Wrench, Jr., San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 12, 1981, Ser. No. 234,063
Int. Cl.³ G06F *15/31*
U.S. Cl. 364—553 **1 Claim**



HISTOGRAM SHAPER

1. A real-time amplitude histogram shaper transforming an input signal V_n according to a first histogram having levels of voltage amplitude into an output signal according to a second histogram having levels of voltage amplitude, comprising:

means for receiving an input analog signal V_{in};

means, whose input is connected to the receiving means, for estimating the histogram of the input signal;

means, whose input is connected to the output of the estimating means, for computing the transfer function required to transform the input signal to an output signal with a desired amplitude histogram;

means, whose input is connected to the output of the computing means, for generating control signals;

means, one of whose two inputs is connected to the receiving means and the other to the output of the generating means, which modifies its input signals by the transfer function $g(V_{in})=V_{out}/-V_{in}$ where V_{out} is the magnitude of the output voltage and V_{in} is the magnitude of the input voltage, the input levels of voltage amplitude being V_1, $V_2, \ldots, V_n$, the output signal thereby having the form of the desired amplitude histogram; wherein

the transfer function modifying means includes n channels, and comprises:

the means for receiving the input analog signal V_{in}, the means being a common junction point for the n channels;

a plurality of n means for voltage translation, one in each of n channels, each means for receiving two input signals, the signal V_{in} and the signal comprising the inverted voltages V_1, V_2, $V_3, \ldots, V_n$, and for translating the input signal V_{in} by the voltage V_1, V_2, $V_3, \ldots, V_n$, respectively; wherein

The plurality of means for voltage translation comprises n diodes connected to the inputs of two adjacent channels, the n-th diode being connected to a source of bias voltage;

a plurality of n saturating unity-gain means, one in each of the n channels, the inputs of the n saturating means being connected to the outputs of the n translating means, each saturating means passing only the signals corresponding to an input signal within a specific voltage range;

the plurality of n saturating unit gain means comprising:

a resistor, in the range of 1k, in series in each channel, one end of the resistor in the first channel being connected to the receiving means, all of the other resistors having one end connected to the junction of two diodes; and

a plurality of n double-diode clippers, one end of each being connected to the other end of the resistor, the other end of each being connected to a source of bias voltage; the transfer function modifying means further comprising:

a plurality of n means for amplifying, each having an input connected to the output of one of the saturating unity-gain means, for amplifying the signals in the first through n-th channels by a magnitude g_1 through g_n, respectively;

the plurality of means for amplifying comprising n field-effect transistors (FETs), each of whose source is connected to the junction of the resistor and the double-diode clipper, and each of whose gate is connected to the means for generating control signals; the transfer function modifying means further comprising:

a means for summing, having n inputs connected to the n outputs of the plurality of amplifying means;

the means for summing comprising:

a plurality of n resistors, in the range of 22k, one end of each being connected to the drain of the FET, the other end of each resistor being connected to a common junction; and

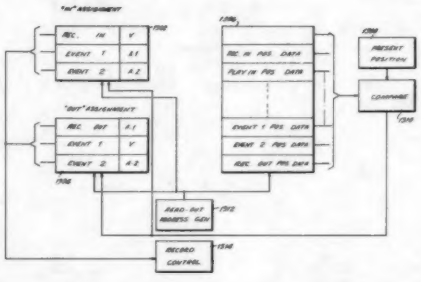
an operational amplifier whose input is connected to the common junction of the resistors, the output signal of the summing means being the desired amplitude histogram.

4,394,745

VIDEO EDITING APPARATUS

William A. Menezes, Mountain View, and Douglas D. Kuper, Campbell, both of Calif., assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 11, 1980, Ser. No. 139,448
Int. Cl.³ G06F *1/00*; H04N *5/785*
U.S. Cl. 364—900 **26 Claims**



1. Video editing apparatus for use with video playback and recording devices wherein information signals on a first record medium are reproduced and recorded on a second record medium, the relative positions of said first and second record media being represented by position data signals, said apparatus comprising means connectable to said video playback and recording devices to provide reord medium position data derived from said position data signals; a console having a plurality of display registers for displaying said record medium position data; a plurality of register selector means associated with corresponding ones of said display registers, each being operable to select its associated display register; a plurality of signal selector means operable to select respective information signals reproduced from said first medium to be recorded on said second medium when a selected one of said media reaches a position represented by the position data displayed in a selected display register; a plurality of indicator means associated with respective ones of said signal selector means and operative to provide predetermined indications to apprise an operator of the relative times at which said respective information signals are to be recorded on said second medium; central processing means responsive to the operation of a selected signal selector means and a selected register selector means for

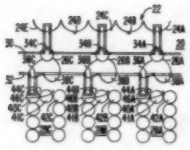
associating the information signal selected by that signal selector means with the position data displayed in the display register corresponding to said operated register selector means, and for initiating the recording on said second medium of the information signal selected by that signal selector means when said selected medium reaches the position represented by the associated position data; and means for communicating between said console and said central processing means.

4,394,746

SWAP GATE FOR ION-IMPLANTED CONTIGUOUS-DISK BUBBLE DEVICES

Richard G. Hirko; Kochan Ju, both of San Jose, and Ian L. Sanders, Sunnyvale, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1981, Ser. No. 331,481
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—36 **9 Claims**



1. A swap gate for ion-implanted contiguous-disk bubble devices comprising

a major loop,

a minor loop having a folded end portion facing said major loop, said end portion having a first region and a second region separated by a third region,

a swap element positioned between said major loop and said minor loop, said swap element having a first portion associated with said major loop, said swap element having a second portion associated with said first region, said swap element having a third portion associated with said second region to form a merge gate, and

conductor means associated with said swap element whereby activation of said conductor means causes the swap function to be effected.

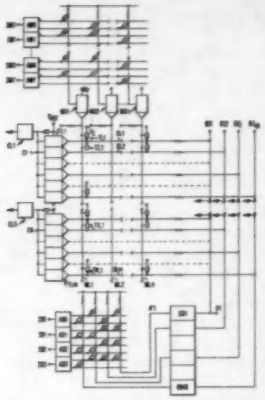
4,394,747

HIGH DENSITY INTEGRATED READ-ONLY MEMORY

Michel J. Grandguillot, Mennecy; Pierre B. Mollier, Boissise le Roi, and Jean-Paul J. Nuez, Mennecy, all of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 5, 1980, Ser. No. 213,289
Claims priority, application France, Dec. 7, 1979, 79 30422
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—104 **6 Claims**

1. Integrated read-only memory including nxm memory cells located at the intersections of m bit lines and n word lines in which binary information of a first type is represented by the presence of a connection to a transistor in a cell, the base of said transistor being connected to a word line while its emitter is connected to a bit line, and in which binary information of a second type is represented by the absence of connection to a transistor in a cell, said memory being of the type in which reading is ensured by means of m read transistors the emitters of which are connected to the bit lines while their bases are connected to a reference voltage supply, the improvement comprising read transistors (TL) arranged into k adjacent sets of m/k consecutive elements, k being an integer submultiple of m, the transistors of each set being provided in the same collector epitaxial bed (51) in a semiconductor substrate with a collector contact (C1) common to all the transistors, the collector contact of each set being connected to a read circuit (CL).

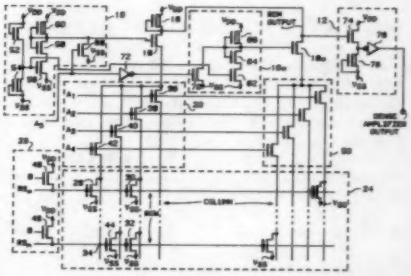


4,394,748

ROM COLUMN SELECT CIRCUIT AND SENSE AMPLIFIER

Jules D. Campbell, Jr., Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 18, 1981, Ser. No. 293,772
Int. Cl.³ G11C *7/00, 17/00*
U.S. Cl. 365—104 **12 Claims**



1. A read only memory column select circuit comprising:

column load means coupled between a first supply and a ROM output;

a primary column select transistor having a first current electrode coupled to the output terminal;

a secondary column select transistor having a first current electrode coupled to a second current electrode of said primary column select transistor;

a program transistor having a first current electrode coupled to a second current electrode of said secondary column select transistor, and a second current electrode coupled to a second supply;

row select means coupled to a control electrode of said program transistor for selectively enabling said program transistor; and

secondary column select means coupled to a control electrode of said secondary column select transistor for selectively enabling said secondary column select transistor;

a primary column select circuit comprising:

voltage divider means coupled between said first and second supplies and to a control electrode of said primary column select transistor, for selectively developing an enabling voltage on the control electrode of said primary column select transistor which is at least equal to, but not substantially greater than, the threshold voltage of said primary column select transistor above the voltage developed on the second current electrode of said primary column select transistor when said secondary column select and program transistors are enabled.

8. A read only memory column select circuit and sense amplifier comprising:

column load means coupled between a first supply and a ROM output;

a primary column select MOS transistor having the drain thereof coupled to the ROM output;

a secondary column select MOS transistor having the drain thereof coupled to the source of said primary column select transistor;

a program MOS transistor having the drain thereof coupled to the source of said secondary column select transistor, and the source thereof coupled to a second supply;

row select means coupled to the gate of said program transistor for selectively enabling said program transistor; and

secondary column select means coupled to the gate of said secondary column select MOS transistor for selectively enabling said secondary column select MOS transistor;

a sense amplifier having an input coupled to said ROM output for sensing the level of voltage at the ROM output and translating said level, comprising:

a source follower transistor having the drain thereof coupled to said first supply, the gate thereof coupled to said ROM output, and the source thereof coupled to an intermediate output of said sense amplifier; and

biasing means coupled to the second current electrode of said source follower transistor for providing a load to said source follower transistor.

4,394,749

PHOTOELECTRIC DEVICE AND METHOD OF PRODUCING THE SAME

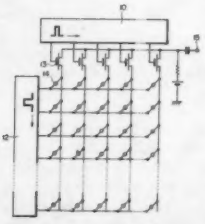
Toshihisa Tsukada, Tokyo; Yukio Takasaki, Hachioji; Tadaaki Hirai, Koganei; Toru Baji, Kokubunji; Hideaki Yamamoto, Hachioji; Yasuo Tanaka, Kokubunji; Eiichi Maruyama, Kodaira, and Sachio Ishioka, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 30, 1980, Ser. No. 154,999

Claims priority, application Japan, Jun. 8, 1979, 54-71272; Nov. 9, 1979, 54-144415

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—106 **8 Claims**



1. A photoelectric device comprising:

a solid state imaging device having a semiconductor substrate including a plurality of photoelectric conversion portions; and

scanning means coupled to said substrate for selecting photoelectric conversion portions from said plurality of photoelectric conversion portions,

wherein the photoelectric conversion portions include a photoconductive layer which covers said semiconductor substrate and which lies electrically in contact with at least said scanning means, and a light transmissive electrode which is formed on said photoconductive layer, characterized in that said photoconductive layer is made of an amorphous chalcogenide material whose principal constituent is Se.

4,394,750

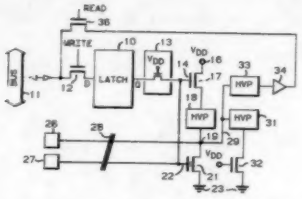
PROM ERASE DETECTOR

Anil Gercekci, Geneva, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 10, 1981, Ser. No. 282,196

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—218 **8 Claims**



1. A programmable read only memory having an erase detector to detect when the memory has been erased and having a data bus, the erase detector comprising: latch means having an input and an output, the input being coupled to the data bus; a first transistor being controllable by the output of the latch means; a memory cell coupled in series with the first transistor and having a control input coupled to the output of the latch means, the memory cell and first transistor forming an output node therebetween; and means for coupling the output node to the data bus.

4,394,751

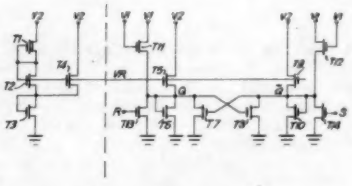
LOW POWER STORAGE CELL

Steve Burstein, Bayshore, and Jay Popper, Kew Gardens, both of N.Y., assignors to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Oct. 23, 1980, Ser. No. 200,085

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—227 **5 Claims**



1. A dual low power storage cell operable in an access mode and a storage mode and comprising,

a flip-flop circuit having first and second transistors, a first terminal of each of said transistors being connected to cell ground potential, a second terminal of each of said transistors being connected to cell supply voltage, a third terminal of said first transistor being connected to the second terminal of said second transistor and a third terminal of said second transistor being connected to the second terminal of said first transistor,

first and second voltage sources,

first switch means operatively connected to said first voltage

source and to said second terminal of said first and second transistors and effective when in an "on" state to place the storage cell in the access mode by applying a supply voltage of a first voltage level to said flip-flop circuit,

second switch means operatively connected to said second voltage source and to said second terminal of said first and second transistors for placing the storage cell in a storage cell in the storage mode by applying a supply voltage of a second voltage level to said flip-flop circuit, said second voltage level being substantially less than said first voltage level, and

means for placing said first switching means in an "off" state, thereby removing said first voltage level from said flip-flop circuit, when the storage cell is in its said storage mode.

4,394,752

DECODING AND SELECTION CIRCUIT FOR A MONOLITHIC MEMORY

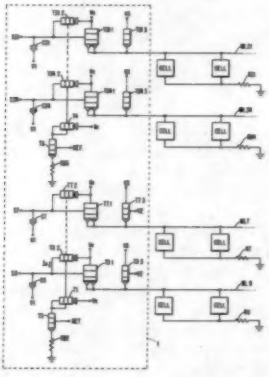
Gerard Boudon; Bernard Denis, both of Mennecy; Virginie de Grivel, Neuilly, and Pierre Mollier, Saint Fargeau Ponthierry, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 22, 1981, Ser. No. 276,136

Claims priority, application European Pat. Off., Sep. 26, 1980, 80430019

Int. Cl.³ G11C 7/00

U.S. Cl. 365—227 **8 Claims**



1. A selection circuit for a memory array having a matrix of cells arranged in n rows and m columns wherein the cells of different rows are connected to n word lines each having selected and non-selected states, the selection of a word line during a selected state being controlled by an address decoding circuit receiving at its input a line addressing signal and having n outputs, each output controlling the state of a line driver transistor, the n driver transistors being of a first conductivity type, each of which includes first and second electrodes and a control electrode, said first electrode being connected to a voltage supply terminal, said second electrode being connected to a word line and said control electrode being connected to an output of said decoding circuit, comprising;

n control transistors having a conductivity opposite to that of said driver transistors, each of said control transistors being associated with one of said driver transistors and having a first conductive electrode connected to said voltage supply terminal and a second conductive electrode connected to the control electrode of its associated driver transistor, and

means including a regulating transistor for supplying a current to the control electrode of each of said control transistors during the selected and non-selected states of an associated word line.

4,394,753

INTEGRATED MEMORY MODULE HAVING SELECTABLE OPERATING FUNCTIONS

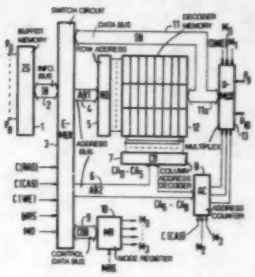
Hans-Joerg Penzel, Wolfratshausen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 12, 1980, Ser. No. 206,133

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1979, 2948159

Int. Cl.³ G11C 7/00

U.S. Cl. 365—236 **3 Claims**



1. In an integrated memory module of the type in which a plurality of memory cells are arranged in a matrix of columns and rows and are addressable by row and column addresses received via a plurality of address terminals in response to strobe signals to provide data on a plurality of write/read lines, in which a bidirectional address buffer is connected to the address terminals for receiving an address, and in which a row address decoder and a column address decoder are connected between the address buffer and the rows and columns of memory cells, respectively, for producing row and column selection signals, the improvement therein comprising:

a data bus connected to said memory and having a plurality of lines equal to the number n of write/read lines to be selected by a higher value portion of a column address;

a mode register operable to receive and store mode signals from and to provide mode signals for the address terminals, the mode signals defining the operating functions of the memory module, in response to predetermined control signals;

a bidirectional data input and data output device connected to said data bus;

said memory matrix divided into small n areas each including an identical plurality of columns of memory cells and all said areas being simultaneously accessible; and

a switch circuit, including a bidirectional operating portion, and selectively operable to connect the address buffer to the address decoders, to connect the address buffer to the mode register and to connect the address register to the data bus in response to receipt of other control signals including the strobe signals.

4,394,754

APPARATUS FOR LOW FREQUENCY TORSIONAL SHEAR WAVE LOGGING

Kenneth H. Waters, Cape Town, South Africa, assignor to Conoco Inc., Ponca City, Okla.

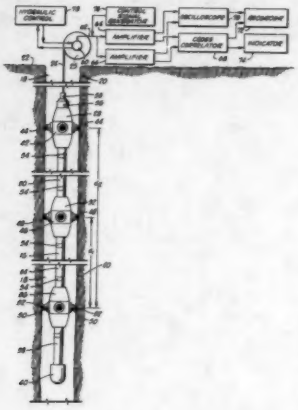
Filed Oct. 9, 1980, Ser. No. 195,368

Int. Cl.³ G01V 1/16

U.S. Cl. 367—75 **6 Claims**

5. A seismic wave detector for detecting shear waves in a formation adjacent a borehole, comprising:

housing means for secure disposition within said borehole;
means carried by said housing means for actuation to position said housing means in said borehole,
armature means of ring shape having plural permanent magnet sections of equal arcuate length intersticed in equal spacing by plural segments of high permeability metal;
rotor means of circular shape disposed for close positioning within said armature means, and having a non-magnetic central portion secured to a concentric high permeability



outer portion that is formed to provide plural cores, and having plural coils equi-spaced therearound as formed on said respective cores for disposition in flux associative positioning to said plural permanent magnets;
means for rigidly securing said armature means to said housing means;
torsion bar means for axially securing said rotor means to said housing means; and
means connecting opposite ends of each of said plural coils to provide a detector output.

4,394,755

BEARING ARRANGEMENT FOR AN OBJECTIVE OF AN OPTICAL APPARATUS FOR WRITING AND/OR READING RECORDING TRACKS BY MEANS OF A RADIATION BEAM

Wilhelmus A. H. Gijzen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

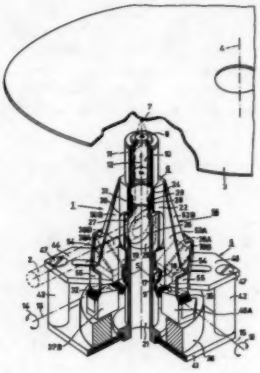
Filed Nov. 17, 1980, Ser. No. 207,510

Claims priority, application Netherlands, Jul. 31, 1980, 8004380

Int. Cl.[3] **G11B** *7/08, 7/12, 21/12*

U.S. Cl. 369—45 **11 Claims**

1. An optical apparatus for, during operation, writing and/or reading recording tracks in a recording surface of a record carrier (3) by means of a radiation beam (2) which is produced by a radiation source and, more specifically, for scanning video and/or audio recording tracks in a reflecting recording surface of a rotary video or audio disc by means of a light beam, which apparatus comprises:
a frame (5),
an objective (6) for concentrating the radiation beam (2) to a radiation spot (7) in a focussing plane, which objective has an upper end (8), which during operation faces the recording surface of a record carrier (3), and a lower end (9), which is remote from the recording surface, and comprises a lens system (10) with an optical axis (11),
a combined bearing arrangement for the objective, which arrangement is a combination of, firstly, a focussing bearing arrangement which is adapted to realize focussing movements (12) of the objective between a rest position and an operating position and relative to the frame in a direction which at least substantially coincides with the optical axis so as to enable any deviations from an average position of the recording surface of the record carrier in a direction perpendicular to the recording surface to be followed with the focussing plane, and, secondly, a pivotal bearing arrangement which is adapted to realize pivotal movements of the objective relative to the frame in pivoting directions (13, 14) about an axis (15, 16) substantially perpendicular to the optical axis (11) of the lens system (10), so as to enable any deviations from an average position of the recording track in directions situated in the recording surface to be followed with the radiation spot (7);
electrically controllable focussing means (32–46) for electri-



cally realizing and controlling the focussing movements (12) of the objective (6);
as well as electrically controllable pivoting means (32–46) for electrically realizing and controlling the pivotal movements of the objective, characterized in that the combined bearing arrangement for the objective comprises a plain bearing arrangement, comprising a stationary bearing member (17), which is substantially coaxial with the optical axis (11) of the objective (6), is connected to the frame (5) and has an at least partly convex outer surface (18), as well as a movable bearing member (19), which is connected to the objective and has a cylindrical inner surface (20) which with a certain amount of bearing clearance cooperates with the convex outer surface (18) of the stationary bearing member (17) in a sliding and pivotal fashion.

4,394,756

GENERATION OF BUSY SIGNALS IN A DIGITAL CONCENTRATOR

Ronald J. Canniff, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

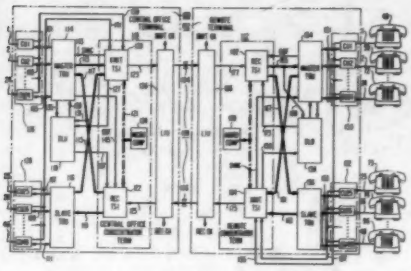
Filed Sep. 12, 1980, Ser. No. 186,618

Int. Cl.[3] **H04Q** *11/04;* **H04J** *3/16*

U.S. Cl. 370—56 **6 Claims**

1. A method of transmitting a busy signal to a calling party when all paths are busy through a digital switching system utilizing successive frames of selectively assigned time slots, said method
characterized by the steps of
transferring a busy code word from a table to a line-to-trunk assignment device (810)
storing a busy status signal in said assignment device to each

newly active line when all paths through said switching system are in use, and



using said busy status signals to transfer said busy code word to each said newly active line.

4,394,757

FRAME FORMAT FOR PCM SPEECH DATA IN A TELEPHONE TRANSMISSION SYSTEM AND DIGITAL TELEPHONE APPARATUS FOR USE WITH THIS FRAME FORMAT

Deepak Muzumdar, Somerset, N.J.; George A. Mierzwa, Boca Raton, Fla.; Richard Sanders, Boca Raton, Fla., and Orrie J. Van der Meiden, Boca Raton, Fla., assignors to Siemens Corporation, Iselin, N.J.

Filed Mar. 31, 1981, Ser. No. 249,395
Int. Cl.³ H04J *3/06, 3/12*
U.S. Cl. 370—100 **5 Claims**

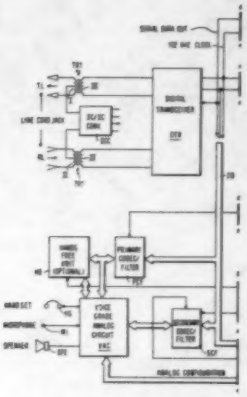
1. Digital telephone apparatus for transmitting and receiving PCM speech data as well as signalling information via a telephone transmission line, said apparatus comprising, in combination:

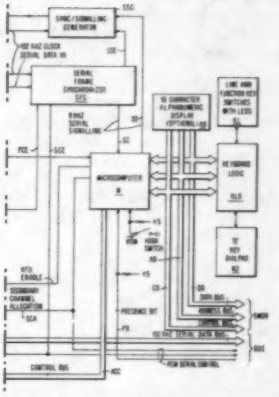
(a) a serial frame synchronizer, adapted to receive serial digital informatioa that was transmitted over said transmission line, said serial frame synchronizer decoding a synchronizing code in said serial digital information and thereby identifying the timing of successive, 125 microsecond frames of data;

(b) a sync/signalling generator connected to said serial frame synchronizer and adapted to transmit serial digital information over said transmission line, said sync/signalling generator being responsive to a first enable signal received from said serial frame synchronizer for shifting out to said transmission line a first outgoing 8 bit data word comprising a synchronization code and a signalling code;

(c) a first codec/PCM filter connected to said serial frame synchronizer and adapted to transmit serial digital information over said transmission line, said first codec/PCM filter being responsive to a second enable signal from said serial frame synchronizer for shifting out to said transmission line a second outgoing 8 bit data word comprising a PCM speech sample, said second outgoing 8 bit word immediately following said first outgoing 8 bit data word; and,

(d) means for generating a third outgoing 8 bit data word connected to said serial frame synchronizer and adapted to transmit serial digital information over said transmission line, said means for generating said third outgoing 8 bit data word being responsive to a third enable signal from said serial frame synchronizer for shifting out to said transmission line said third outgoing 8 bit data word, said





third outgoing 8 bit data word immediately following said second outgoing 8 bit data word.

4,394,758

SYNCHRONIZING UNIT FOR RECEIVING SECTION OF PCM STATION

Roberto D. Donne, Milan, Italy, assignor to Italtel Societa Italiana Telecomunicazioni, S.p.A., Milan, Italy

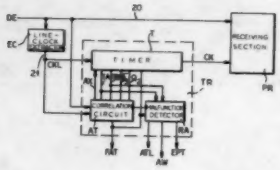
Filed Jun. 29, 1981, Ser. No. 278,065
Claims priority, application Italy, Jun. 30, 1980, 23104 A/80
Int. Cl.³ H04J *3/08*
U.S. Cl. 370—105 **13 Claims**

1. A synchronizing unit controlling the operation of a receiving station of a PCM station of a telecommunication system, comprising:

timing means stepped by line-clock pulses extracted from an incoming bit stream organized into alternating first and second frames each containing a multiplicity of channels accommodating respective data words, an initial channel No. 0 of each first and second frame normally containing a respective alignment word A and B characterized by at least one invariable bit in a predetermined time position, and timing means generating clock signals fed to said receiving section and further emitting first and second

marking pulses TA and TB in a time slot assigned to the No. 0 channel of said first and second frames, respectively;

correlation means including a decoder receiving said incoming bit stream and emitting respective identification pulses AX and BX upon recognizing said alignment words A and B, said correlation means further including logic circuitry generating an error signal FAT upon noncoincidence of said marking pulses TA and TB with the respective identification pulses AX and BX, said logic circuitry feeding



corrective signals into said timing means for readjusting same to re-establish coincidence between said marking pulses and the corresponding identification pulses; and

a malfunction detector connected to said correlation means and to said timing means for receiving therefrom at least one of said identification pulses and the corresponding marking pulse, said detector including gating means for producing an alarm indication AW in the absence of coincidence therebetween.

4,394,759

TRANSMITTING SECTION OF PCM STATION

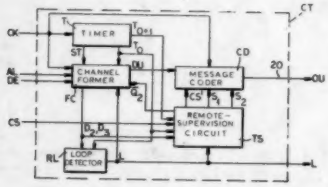
Roberto Delle Donne, Milan, Italy, assignor to Italtel Societa Italiana Telecomunicazioni S.p.A., Milan, Italy

Filed Jun. 29, 1981, Ser. No. 278,064

Claims priority, application Italy, Jun. 30, 1980, 23105 A/80

Int. Cl.³ H04J *3/12, 3/14*

U.S. Cl. 370—110.1 **12 Claims**



1. A transmitting section of a PCM station of a telecommunication system, comprising:

channel-forming means for organizing n-bit data words into alternating first and second outgoing frames each containing a multiplicity of channels accommodating respective data words, said channel-forming means including an input register with n stages accommodating respective bits of an arriving data word loaded into same, an output register with n stages, and a multiplexer with n outputs connected to respective stage inputs of said output register and with a plurality of inputs connected to respective stage outputs of said input register, said multiplexer having additional inputs connected to points of fixed potential representing predetermined logical values;

timing means stepped by a local clock for identifying an initial channel No. 0 of each frame and controlling said multiplexer to replace certain bits of a data word in the No. 0 channel of each frame by predetermined bits yielding partly invariable alignment words A and B loaded into said output register in said first and second frames, respectively, said timing means emitting a frame-designating signal switching part of the outputs of said multiplexer to certain of said additional inputs thereof during the No. 0 channel of said second frames while leaving other multiplexer outputs connected to the associated stage outputs;

decoding means emitting supervisory instructions upon detecting certain bit groupings in a data word loaded into said input register in the No. 0 channel of a frame; and

switching means connected to said decoding means for generating internal signals in response to said supervisory instructions, said multiplexer being further controlled by said switching means for modifying a bit in one of said alignment words in the presence of said supervisory instructions.

4,394,760

PROCESS FOR MONITORING ANALOG AND DIGITAL MOBILE RADIO CONNECTIONS

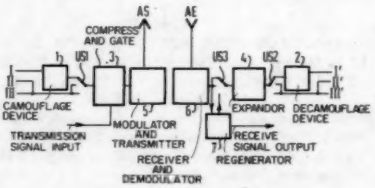
Karl Kammerlander, Wolfratshausen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 2, 1981, Ser. No. 238,071

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1980, 3012513

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—111 **4 Claims**



1. In a process for monitoring analog and digital mobile radio connections in a mobile radio network comprising a plurality of mobile radio subscriber stations and a plurality of base stations which are mutually spaced in a cellular arrangement having rigidly prescribed overlapping radio ranges which are directly adjacent one another as radio range groups in which the total number of available frequency channels is repeated, in which the frequency distribution plan for the base stations is designed such that common channel disturbances in a radio range, including an extended boundary zone of the overlapping, are substantially eliminated, in which at least the signaling in digital form between the base stations and the mobile subscriber stations is carried out over duplex time-division multiplex organization channels, in which radio range related information blocks are time compressed for transmission, and in which the time-compressed information blocks are expanded to obtain useful information, the improvement therein comprising the steps of:

time compressing analog radio range related information blocks which are to be transmitted as useful signals in specific time slots to produce gaps between the information blocks including delaying the compressed information blocks;

inserting data block sequences into the gaps, containing monitoring signals including subscriber identification, the signal-to-noise ratio of the connection and subscriber and network internal signals;

transmitting the composite signals so formed to a receiver and receiving the same;

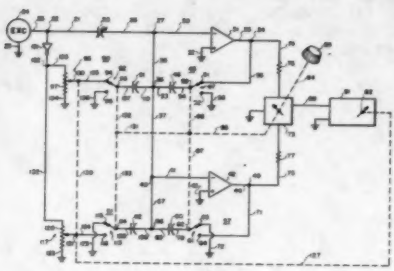
extracting the data block sequences from the received composite signals; and

then expanding the time-compressed information blocks to their original lengths to obtain the useful information.

4,394,761
CURRENT SWITCHING TECHNIQUE

John L. Clark, Columbia Heights, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 16, 1981, Ser. No. 254,820
Int. Cl.³ H02H 7/20
U.S. Cl. 371—8 6 Claims



1. A redundancy circuit comprising, jn combination:

a measuring impedance;

first and second operational amplifiers having inverting input terminals, non-inverting input terminals, and output terminals;

a source of excitation voltage with respect to ground;

means connecting said source through said measuring impedance producing a signal current into said inverting input terminals to provide a signal to said amplifiers;

means grounding said non-inverting input terminals;

first and second feedback impedances;

and switch means having a first condition in which said first feedback impedance is connected between the output terminal and the inverting input terminal of said first amplifier, and said second feedback impedance is connected between said inverting terminal of said second amplifier and ground, so that the output of said first operational amplifier is representative of the signal current from said measuring impedance,

said switch means having a second condition in which said second feedback impedance is connected between the output terminal and the inverting input terminal of said second amplifier, and said first feedback impedance is connected between said inverting terminal of said first amplifier and ground, so that the output of said second operational amplifier is representative of the signal from said measuring impedance.

4,394,762
PULSE-CODE MODULATION SIGNAL PROCESSING CIRCUIT

Daiki Nabeshima, Kamakura, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 6, 1981, Ser. No. 222,769
Int. Cl.³ G06F 11/10
U.S. Cl. 371—38 10 Claims

1. A signal processing circuit for recording PCM signals, comprising:

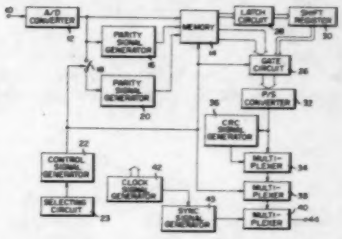
A/D coverting means for sampling at a predetermined frequency analog signals to be recorded and converting sampled signals into digital signals forming sample words;

mode determining means for generating a first mode signal when a sample word from the A/D converting means consists of N bits, where N is a positive integer, and a second mode signal when a sample word from the A/D converting means consists of N+M bits, where M is a positive integer;

error correction word generating means connected to said A/D converting means and mode determining means for generating, in response to a first mode signal, K+L error correction words, each consisting of N bits, and where K and L are positive integers, for a predetermined number of N-bit sample words and for generating, in response to a second mode signal, K error correction words each consisting of M+N bits for the same number of (M+N)-bit words as that of the N-bit sample words;

first memory means connected to said A/D converting means and said error correction word generating means for interleaving error correction words among the sample words corresponding thereto;

arranging means to desired PCM signals connected to said first memory means and mode determining means for allotting, in response to a first mode signal, first by said predetermined number of N-bit sample words and then secondly the K+L error correction words to one horizontal scanning segment of a television signal and for



dividing, in response to a second mode signal, each of the sample words and error correction words into an M-bit component and an N-bit component and then allotting to the horizontal scanning segment the M-bit components of said predetermined number of sample words, the M-bit components of K error correction words, the N-bit components of said predetermined number of sample words, and the N-bit components of K error correction words in that order, thereby allotting N-bit components of said predetermined number of said sample words and the N-bit components of K error correction words to a slot to which L error correction words are allotted in response to a first mode signal; and

means for recording on a video tape the PCM output signals from said arranging means and mode determining means in a form which is adapted to a data format for the television signal.

4,394,763
ERROR-CORRECTING SYSTEM

Genzo Nagano, and Masao Takahashi, both of Yokohama, Japan, assignors to Fujitsu Limited, Tokyo, Japan

PCT No. PCT/JP80/00199, § 371 Date May 1, 1981, § 102(e) Date Apr. 24, 1981, PCT Pub. No. WO81/00641, PCT Pub. Date Mar. 5, 1981
PCT Filed Aug. 29, 1980, Ser. No. 261,181
Claims priority, application Japan, Aug. 31, 1979, 54-111152
Int. Cl.³ G06F 11/10; G11C 29/00
U.S. Cl. 371—38 11 Claims

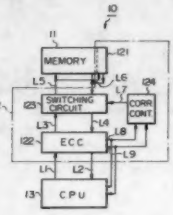
1. An error-correcting system, operatively connected between a main memory and a central processing unit, comprising:

an error correction code logic circuit, which can correct n-bit errors, where n is a positive integer, and detect n+1-bit errors;

first means, operatively connected to said central processing unit and said error correction code logic circuit, for discriminating whether an error, occurring in said main memory, is a soft error or a hard error;

second means for storing data for a defective memory cell of said main memory, which defective memory cell produces the hard error;

third means, operatively connected to said main memory, said first means and said second means, for, when a hard error is found by using said first means, switching the data for the defective memory cell of said main memory to said second means; and



fourth means, operatively connected to said first means and said third means, for effecting a validation operation with respect to the data to be stored in said second means.

4,394,764

LASER PROCESSING APPARATUS

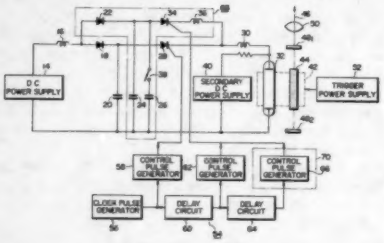
Ken Ishikawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 20, 1981, Ser. No. 294,816

Claims priority, application Japan, Aug. 28, 1980, 55-118738

Int. Cl.³ H01S *3/00*

U.S. Cl. 372—38 **8 Claims**



1. A laser processing apparatus comprising:

direct current power supply circuit means;

main discharge circuit means connected to said direct current power supply circuit means for supplying main discharge current thereto;

falling waveform control circuit means connected to said direct current power supply circuit means for controlling the falling of the discharge current waveform;

discharge current stopping circuit means connected to said waveform control circuit means for effecting the control thereof so that the discharge current is stopped when the discharge current becomes lower than a predetermined value;

main control circuit means connected to said main discharge circuit means, falling waveform control circuit means and discharge current stopping circuit means for effecting the control of these individual circuit means at predetermined timings; and

laser beam oscillating means connected to said main discharge circuit means and falling waveform control circuit means for providing a laser beam according to the main discharge current and discharge current having a controlled falling waveform portion.

4,394,765

ELECTRO-SLAG REMELTING FURNACE FOR CONSUMABLE ELECTRODES AND HAVING AN ELECTRODE DRIVE

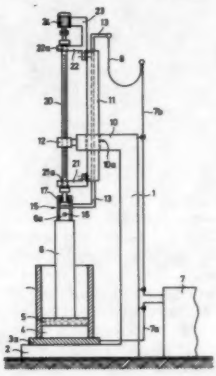
Uwe Reimpell, Hanau; Helmut Gröf, Bruchköbel; Franz-Georg Knell, and Anton Wamser, both of Hanau, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 25, 1981, Ser. No. 324,995

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1980, 3047214

Int. Cl.³ H05B *7/109*

U.S. Cl. 373—52 **10 Claims**



1. An electro-slag remelting furnace for consumable electrodes and comprising a mold for receiving a melt formed from the electrode material; at least one drive motor and at least one spindle and an associated spindle nut for vertical movement of the electrode; at least one guide column, which is provided for vertically guiding the consumable electrodes and which extends parallel with the spindle and relative to which the spindle is rotatably mounted at its two ends; and at least one clamping device for the consumable electrodes comprising the spindle nut which is of fixed location, the spindle which is mounted in the spindle nut and is vertically displaceable therein, the spindle being connected by its lower end to the clamping device; and a guide in which the guide column is displaceably mounted, together with the spindle.

4,394,766

GRAPHITIZATION SYSTEM METHOD AND APPARATUS

Berch Y. Karagoz, Grand Island, N.Y., assignor to Great Lakes Carbon Corporation, New York, N.Y.

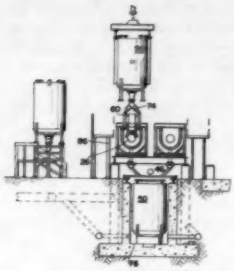
Filed Aug. 3, 1981, Ser. No. 289,249

Int. Cl.³ H05B *3/60*; F27D *3/00*

U.S. Cl. 373—120 **23 Claims**

1. An apparatus for the production of graphite from carbon bodies comprising a refractory lined open-topped metal and generally U-shaped shell furnace supported by structural support means, a column of carbon bodies within said furnace which are in end abutting relationship surrounded by particulate thermal insulation medium and held in place by and in electrical contact with two electrical power heads located at the ends of said furnace at least one of which is movable by means effective to apply pressure to said column, said power heads being adapted to conduct a current of electricity through

said column of bodies to convert the carbon bodies to graphite by the Joule effect, and means to remove said thermal insulation medium by gravity dumping through the bottom of said furnace.

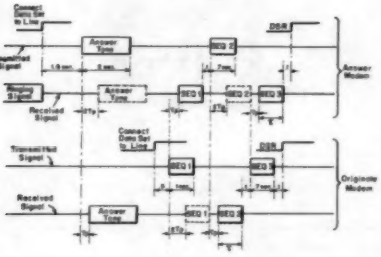


4,394,767

DATA TRANSMISSION OVER LONG DISTANCE CIRCUITS

Martin N. Y. Shum, Brookfield, Conn., assignor to General DataComm Industries, Inc., Danbury, Conn.

Filed Jul. 7, 1981, Ser. No. 281,059
Int. Cl.³ H04B 3/20
U.S. Cl. 375—13 **2 Claims**



1. A method of handshaking between an originate modem and an answer modem interconnected by a communication line comprising the steps of:

causing a ringing signal to be applied to the answer modem in response to a signal from the originate modem;

connecting the answer modem to the communication line after receipt of the ringing signal;

transmitting an answerback tone from the answer modem to the originate modem after a period of silence following connection of the answer modem to the communication line;

connecting the originate modem to the communication line after receipt of the answerback tone;

waiting sufficiently long to reactivate any echo suppressors in the communication line;

thereafter transmitting first and second training sequences, one from the originate modem to the answer modem and the other from the answer modem to the originate modem, said first and second training sequence being sufficiently long to train up any echo canceller in the communication line;

detecting if the lengths of the first and second training sequences as received are significantly shorter than their lengths as transmitted; and

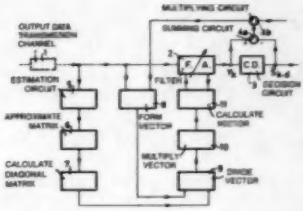
in the event the training sequences as received are significantly shorter than their lengths as transmitted, transmitting a sacrificial carrier at the beginning of each transmission of data in a new direction on said communication line and in the event that the training sequences are not significantly shorter as received than as transmitted beginning each transmission of data in a new direction on said communication line without a sacrificial carrier.

4,394,768

ADAPTIVE SYSTEM IN A DIGITAL DATA RECEIVER PROVIDING COMPENSATION FOR AMPLITUDE AND PHASE DISTORTIONS INTRODUCED BY A DATA TRANSMISSION CHANNEL

Hikmet Sari, Alfortville, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 14, 1981, Ser. No. 263,453
Claims priority, application France, May 14, 1980, 80 10863
Int. Cl.³ H04L 25/03
U.S. Cl. 375—14 **2 Claims**



1. In a digital data receiver, an adaptive system providing compensation for amplitude and phase distortions introduced by a data transmission channel and comprising an adaptive equalizing circuit receiving a signal vector X_k from the data transmission channel output and producing an output signal y_k, a decision circuit receiving this output signal y_k and producing an estimation $\hat{s}_{k-d}$ of each one of the digital data s_{k-d} applied to the data transmission channel input, a summing circuit receiving said output signal y_k and said estimation $\hat{s}_{k-d}$ for producing a difference signal $e_k = y_k - \hat{s}_{k-d}$, and a multiplying circuit for multiplying said difference signal e_k by an iteration step α_k, characterized in that the adaptive equalizing circuit is a non-recursive transversal filter having N adjustable weighting coefficients and the adaptive systems comprises for the determination of these coefficients by consecutive iterations:

a first circuit for determining, in a matrix A_k which is an estimation of the square signal autocorrelation matrix $A = E(X_k \cdot X_{kTR}{}^{TR})$ at an instant $t_o + kT$, where E is the expectation operator, X_k is the transpose of X_k, t_o is a constant, k is an integer and T is the duration of a data symbol period, the $(N/2+1)$ first elements $a_{i(k)}$ of the first row if N is even, or the $(N+1)/2$ first elements a_i of the first row if N is odd, said estimation being based on the relation:

$$a_i^{(k)} = \beta a_i^{(k-1)} + x_k \cdot x_{k-i}$$

where i is an integer with $0 \leqq i \leqq N-1$ and β is a constant with $0 < \beta < 1$,

a second circuit connected to said first circuit for forming a vector

$$\Gamma^{(k)} = [r_0^{(k)}, r_1^{(k)}, r_2^{(k)}, \ldots, r_{N-2}^{(k)}, r_{N-1}^{(k)}]^{TR} \text{ in which } r_i^{(k)} = a_i^{(k)}$$

in which $r_i^{(k)} = a_i^{(k)}$ for every i not exceeding N/2 if N is even, or not exceeding $(N-1)/2$ if N is odd, and

$$r_i^{(k)} = a_{N-i}^{(k)}$$

for every i exceeding said limits, a third circuit connected to said second circuit for forming a vector

$$\Lambda^{(k)} = [\lambda_0^{(k)}, \lambda_1^{(k)}, \lambda_2^{(k)}, \ldots, \lambda_{N-1}^{(k)}]^{TR},$$

whose components are the eigenvalues of a circulant matrix having the transpose of the said vector $U^{(k)}$ as a first row, with the aid of the relation:

$$\Lambda^{(k)} = \sqrt{N} \cdot P \cdot U^{(k)}$$

where P is the unitary matrix of the order N defined by:

$$P = |P_{fg}|$$
(f,g=0, 1, 2, . . . , N−2, N−1)
and

$$P_{fg} = \frac{1}{\sqrt{N}} \exp[j\, 2\pi fg/N],$$

a fourth circuit connected to the data transmission channel output and the multiplying circuit output for forming a vector $Q^{(k)}$ with the aid of the relation:

$$Q^{(k)} = a_k e_k \cdot P^{cc} \cdot X_k$$

where P^{cc} is the complex conjugate of said unitary matrix P,

a fifth circuit connected to said fourth and third circuits for dividing said vector $Q^{(k)}$ by said vector $\Lambda^{(k)}$ on a term-by-term basis so that the resulting vector

$$F^{(k)} = [f_0^{(k)}, f_1^{(k)}, f_2^{(k)}, \ldots f_{N-1}^{(k)}]^{TR} = Q^{(k)}/\Lambda^{(k)}$$

has components $f_i^{(k)} = q_i^{(k)}/\lambda_i^{(k)}$ for every i not exceeding N−1,

a sixth circuit connected to said fifth circuit for multiplying said vector $F^{(k)}$ by said unitary matrix for producing a vector $H^{(k)} = P \cdot F^{(k)}$,

a seventh circuit connected to said sixth circuit and said transversal filter for up-dating the vector C_k of the N weighting coefficients of said transversal filter at the instant $t_o + kT$ so as to produce a coefficient vector C_{k+1} at the instant $t_o + (k+1)T$ in accordance with the relation:

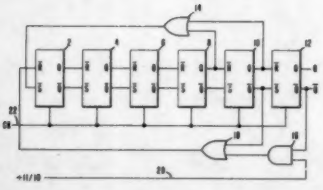
$$C_{k+1} = C_k - H^{(k)}$$

4,394,769

DUAL MODULUS COUNTER HAVING NON-INVERTING FEEDBACK

John M. Lull, Fullerton, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Jun. 15, 1981, Ser. No. 274,005
Int. Cl.³ H03K *21/36, 21/10, 23/08*
U.S. Cl. 377—116 **11 Claims**



1. A self-initializing ring counter, comprising:

(A) means for receiving a clock signal;

(B) a plurality of n flip-flops, each of said flip-flops, comprising:

(1) a master and a slave each having its own clock input, the clock inputs of both being connected to receive the same clock signal, said master and slave being enabled by said clock signal at different times, and

(2) an $\overline{R}$ input, an $\overline{S}$ input, a Q output and a $\overline{Q}$ output;

(C) said plurality of said n flip-flops being connected in serial succession, whereby the Q and $\overline{Q}$ outputs of each flip-flop are connected to the $\overline{R}$ and $\overline{S}$ inputs respectively, of the next successive flip-flop; and

(D) said counter having a non-inverting feedback, comprising:

(1) first means coupling the $\overline{Q}$ outputs of the $(n-1)^{th}$ flip-flop and $(n-2)^{th}$ flip-flop to the $\overline{S}$ input of the $(1)^{st}$ flip-flop, and

(2) second means coupling the $\overline{Q}$ outputs of the $(n-1)^{th}$ flip-flop and the $(n)^{th}$ flip-flop to the $\overline{R}$ input of the $(1)^{st}$ flip-flop.

4,394,770

X-RAY FILM PACKAGE AND METHOD AND APPARATUS FOR MAKING THE SAME

Peter J. La Franca, 719 Cunningham St., Rockford, Ill. 61102

Filed Jun. 29, 1981, Ser. No. 278,739
Int. Cl.³ G03B *41/16*; G03C *5/16*
U.S. Cl. 378—169 **11 Claims**

1. An X-ray film package for applying dimensional indicia on the developed X-ray film, said package comprising, a sheet of X-ray film having pre-exposed but undeveloped dimensional indicia thereon, and a cover completely enclosing said film, said cover being formed of material which protects said film from normal light but which is penetrated by X-radiation whereby, when the package is placed adjacent an object and subjected to X-radiation and the film thereafter is developed, both the object and said dimensional indicia appear on said film with the dimensional indicia being black on the developed film.

4,394,771

APPARATUS FOR MOVING FILM CASSETTES

Pierre Charrier, 5520 Grande-Prairie, St. Léonard, Quebec, Canada

Filed Apr. 1, 1981, Ser. No. 250,034
Int. Cl.³ G03B *41/16*
U.S. Cl. 378—172 **5 Claims**

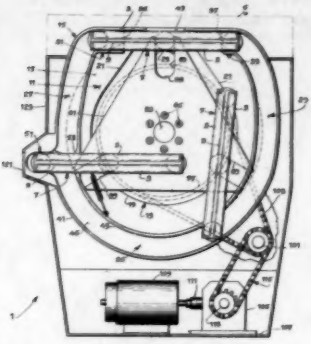
1. An apparatus for use in taking X-ray pictures, comprising:

a plurality of X-ray film holders, each holder being adapted to hold two X-ray films in back-to-back relation;

means for intermittently rotating the holders in a closed loop past a picture-taking station on the loop, each holder stopping at the station during the time a picture is taken and presenting one of its two films for a first picture as it first passes said station, and

means for rotating each holder through 180° as it is moved

through the closed loop after its first passage at the station, to present the other film it carries for a second picture at



the picture-taking station during a second passage at said station.

4,394,772

RADIOGRAPHIC CASSETTE

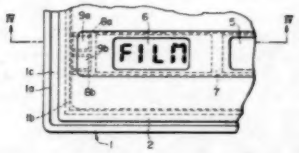
Tadaomi Okamoto, Fujisawa; Masayuki Ohta, Sakado, and Makoto Watanabe, Tokyo, all of Japan, assignors to Okamoto Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 326,839

Claims priority, application Japan, Oct. 6, 1981, 56-148420[U]

Int. Cl.³ G03B 41/16

U.S. Cl. 378—182 **1 Claim**



1. A radiographic cassette comprising a film-receiving plate and a film-keeping plate engageable with said film-receiving plate in light-tight relation to press a film against said film-receiving plate, in which said film-keeping plate is provided with a solar battery and a liquid crystal indicator adapted to be actuated by currents therefrom, both being open to view, and provided on its inner surface with a pair of conductive planes isolated from each other and connected to said battery, and said film-receiving plate is provided on an associated position of its inner surface with a conductive plate which is adapted to come in contact with said conductive planes to cause shorting.

4,394,773

FINGERPRINT SENSOR

Hartwig Ruell, Mount Laurel, N.J., assignor to Siemens Corporation, Iselin, N.J.

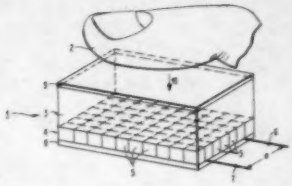
Filed Jul. 21, 1980, Ser. No. 170,606

Int. Cl.³ G06K 9/00

U.S. Cl. 382—4 **19 Claims**

1. A fingerprint sensor for transforming the fingerprint information of a finger under investigation into an electric output signal, comprising in combination:

(a) a contact device containing a piezoelectric material, said contact device having surfaces including a contact surface for exercising a contact pressure thereon by means of said finger, thereby changing the density of electric charges on said surfaces according to the fingerprint pattern of said finger; and



(b) electrical means for providing the electric output signal in accordance with the distribution of said charges on at least one of said surfaces.

4,394,774

DIGITAL VIDEO COMPRESSION SYSTEM AND METHODS UTILIZING SCENE ADAPTIVE CODING WITH RATE BUFFER FEEDBACK

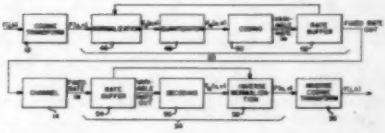
Robert D. Widergren, Saratoga; Wen-Hsiung Chen, Sunnyvale; Stanley C. Fralick, Saratoga, and Andrew G. Tescher, Claremont, all of Calif., assignors to Compression Labs, Inc., San Jose, Calif.

Continuation of Ser. No. 969,991, Dec. 15, 1978, Pat. No. 4,302,775. This application Jun. 26, 1981, Ser. No. 277,981

The portion of the term of this patent subsequent to Nov. 24, 1998, has been disclaimed.

Int. Cl.³ G06K 9/36; H04N 9/32, 7/12; H04B 3/46

U.S. Cl. 382—56 **11 Claims**



5. A data compression method for adaptive coding a stream of data coefficients in which some of said coefficients are of zero magnitude, and transferring said adaptively coded coefficients through a limited bandwidth medium, comprising the steps of:

multiplying said data coefficients by a normalization factor which includes an automatically variable feedback control component and a predetermined compression component and putting out the product resulting therefrom as normalized data coefficients;

encoding said normalized transform coefficients in accordance with said predetermined data coding scheme including variable length, statistically derived, minimum redundancy coding of amplitude coefficients and including run length coding of zero amplitude coefficients for further compression and transfer through said limited bandwidth medium

writing said minimum redundancy and run length coded coefficients into a compressor buffer memory at a high asynchronous rate and deriving said feedback control component as a function of the instantaneous quantity of data in said memory in relation to the capacity thereof; and,

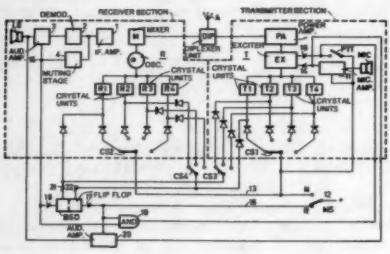
reading out to said limited bandwidth medium said coded coefficients at a predetermined low synchronous transmission rate.

4,394,775

FREQUENCY DIVISION COMMUNICATION SYSTEM WHEREIN CONVENTIONAL TRANSMITTER-TRANSCEIVER CAN BE USED AS A REPEATER OR LOCAL BASE STATION

John Bruinsma, Clayton, Australia, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 22, 1981, Ser. No. 266,575
Claims priority, application Australia, May 29, 1980, PE03784
Int. Cl.³ H04B 7/14, 1/44
U.S. Cl. 455—17 5 Claims



1. A transceiver for use in a frequency division, two-frequency multi-channel communication system having a multi-channel transmitter with transmission channel selection means for selecting a channel transmitter frequency and a multi-channel receiver with receive channel selection means for selecting a channel receiving frequency band, characterized in that said receiver further comprises an automatic control system coupled to said transmission channel selection means and said receive channel selection means, said automatic control system comprising:

a multi-stable periodic switching device for switching the receive channel selection means so as to sequentially select a first channel receiving frequency band and a second channel receiving frequency band, and for switching the transmission channel selection means so as to select a first channel transmitter frequency and a second channel transmitter frequency, said multi-stable periodic switching device having a control input which, in response to a keying signal, arrests the periodic switching therof;

detection means fed by signals received within the frequenccy band of a selected receive channel which, in response to detection thereby of a received signal having predetermined characteristics, applies said keying signal to the control input of said multi-stable periodic switching device and causes said transmitter to transmit information carried by the received signal; and

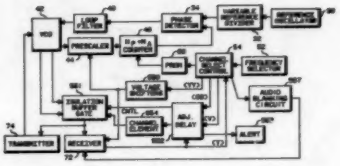
a steering circuit, coupled between said multi-stable periodic switching device and said transmission channel selection means, having steering modes for determining which channel transmitter frequency is to be selected, in which a first steering mode causes said transmission channel selection means to select said second channel transmitter frequency in response to a received signal within said first channel receiving frequency band and, alternately, to select said first channel transmitter frequency in response to a received signal within said second channel receiving frequency band.

4,394,776

PRIORITY CHANNEL SYSTEM FOR A SYNTHESIZED TRANSCEIVER

Jaime A. Borras, Hialeah; Ruben J. Gonzalez, Miami, both of Fla.; Daniel M. Smith, Schaumburg, Ill., and Alfred B. Wieczorek, Plantation, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 6, 1981, Ser. No. 251,565
Int. Cl.³ H04B 1/38; H03J 7/00
U.S. Cl. 455—76 7 Claims



1. A portable transceiver including a digital frequency synthesizer capable of tuning a plurality of communications channels, said transceiver including a priority channel monitoring system comprising:

a crystal channel element capable of providing injection signals to the transceiver for tuning to a predesignated priority channel;

sampling means coupled to the digital frequency synthesizer and the crystal channel element, alternately supplying injection signals from said synthesizer and said channel element to the receiver portion of the transceiver;

carrier detection means detecting the presence of carrier signal in the receiver section of the transceiver;

priority means coupled to said carrier detection means and said sampling means, disrupting the operation of the sampling means and establishing tuning of the transceiver for transmission or reception at the communication channel corresponding to said crystal controlled channel element when a carrier signal is detected on that frequency corresponding to said crystal controlled channel element; and

delay means coupled to said sampling means to maintain the tuning of the transceiver at said priority channel for a predetermined interval to enable a responding transmission on said priority channel from a transceiver operator.

4,394,777

METHOD OF AND SYSTEM FOR CLASSIFYING EMERGENCY LOCATING TRANSMITTERS AND EMERGENCY POSITIONS INDICATING RADIO BEACONS

Paul E. Wren, Severna Park, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

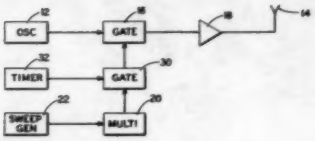
Filed Dec. 12, 1979, Ser. No. 102,592
Int. Cl.³ H04B 7/26
U.S. Cl. 455—95 10 Claims

1. A distress location transmitter, comprising:

oscillator means for generating a carrier signal to be supplied to an antenna during a distress call;

means for modulating said carrier signal with a distress characteristic waveform; and

means for periodically disabling said modulating means at a



predetermined rate corresponding to one of a plurality of classes of user for said distress location transmitter in providing a period of unmodulated carrier to identify said user class associated with said distress call.

4,394,778

TUNING CONTROL APPARATUS OF RECEIVER

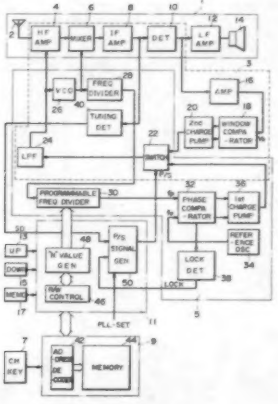
Shigehiko Ikeguchi, and Kouzi Tanaka, both of Oora, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi and Tokyo Sanyo Electric Co. Ltd., Gunma, both of, Japan

Filed Oct. 14, 1980, Ser. No. 196,272

Claims priority, application Japan, Oct. 16, 1979, 54-133986

Int. Cl.³ H04B 1/26

U.S. Cl. 455—182 **9 Claims**



1. A tuning control apparatus of a receiver for tuning said receiver to a desired broadcasting wave, comprising:

a tuner including a voltage controlled oscillator as a local oscillator for generating an intermediate frequency output when the receiver is tuned to the desired broadcasting wave,

an intermediate frequency circuit for receiving the output of said tuner,

a frequency discriminator for receiving the output of said intermediate frequency circuit,

a phase locked loop for providing a control voltage to said voltage controlled oscillator on the occasion of a desired broadcasting wave selecting operation by said receiver such that said intermediate output frequency is obtained from said tuner, said phase lock loop including a programable frequency dividing means for dividing the voltage controlled oscillator output by a selectable ratio such that the oscillator has a preset frequency related to the desired broadcasting wave,

an automatic frequency control loop responsive to the output of said frequency discriminator for providing a control voltage to said voltage controlled oscillator on the occasion of the reception of the desired broadcasting wave by said tuner,

broadcasting wave sensing means responsive to the levels of both the output from said intermediate frequency circuit and an S curve signal obtained from said frequency discriminator for sensing the reception of said broadcasting wave and providing a reception signal relating thereto, and

switching means responsive to said reception signal from said broadcasting wave sensing means for switchably selecting either said phase locked loop or said automatic frequency control loop for supply of said control voltage to said voltage controlled oscillator.

4,394,779

METHOD AND SYSTEM FOR RECEIVING DISTORTION-FREE FM SIGNALS BY VEHICULAR RADIOS

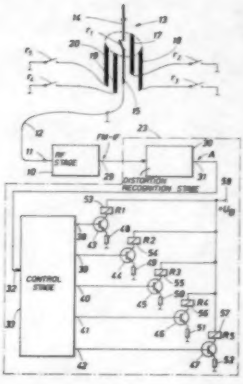
Jens Hansen, Diekholzen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 6, 1981, Ser. No. 231,953

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 3006627

Int. Cl.³ H04B 1/10

U.S. Cl. 455—277 **14 Claims**



1. Method of reducing distortion in the reception of signals by vehicular FM radio receivers, in which the receiver has an antenna system (13), the system including a main antenna element (14) matched to the frequency band of the receiver, and an auxiliary rod antenna element (15, 17, 18, 19, 20) having different directonal characteristics which is short with respect to the main antenna element;

as RF stage (10);

a distortion recognition stage (30) connected to the RF stage and providing an output signal when distorted reception is recognized, comprising the steps of

connecting said main antenna element to the receiver;

recognizing non-distortion - distortion characteristics of the signal from the RF stage in the recognition stage;

(a) upon recognition of non-distortion, leaving said main antenna element connected;

(b) upon recognition of a distorted signal, connecting the auxiliary antenna element of a first directional characteristic which has a different directional characteristic than said main antenna element to the RF stage of the receiver;

(c) continuing to recognize the characteristic of the signal for a predetermined time interval (τ);

(d-1) upon sensing non-distortion characteristic of the signal

during said predetermined time interval, connecting the main antenna element to the RF stage of the receiver; or

(d-2) upon sensing continued distortion characteristic of the signal, connecting said auxiliary antenna element of a second direictional characteristic different from said first directional characteristic to the RF stage of the receiver;

(e) and continuing steps (c) and (d); and

wherein the step of connecting the auxiliary rod antenna element of different directional characteristics comprises selectively connecting specifically oriented shielding elements (17–20) surrounding said rod antenna element (15) to ground or chassis, while leaving other selectively oriented shielding elements unconnected to provide for selectively specific directional characteristic of the auxiliary antenna element.

4,394,760

BALLOON COLLECTOR/DIRECTOR SUNSUBSATCOM CONCEPT

Gregory C. Mooradian, Del Mar, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 2, 1981, Ser. No. 239,254

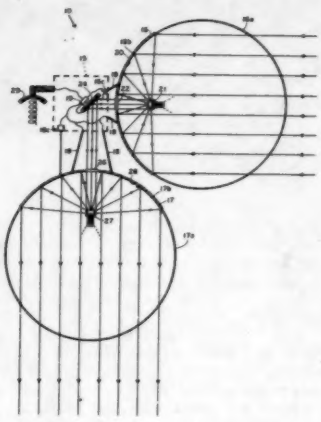
Int. Cl.³ H04B 9/00

U.S. Cl. 455—618 **12 Claims**

8. A method for optically transmitting data from an orbiting satellite comprising:

inflatably distending a sunlight reflecting and collecting surface in a first distensible means to reflect and collect sunlight;

modulating the reflected and collected sunlight with the data; and

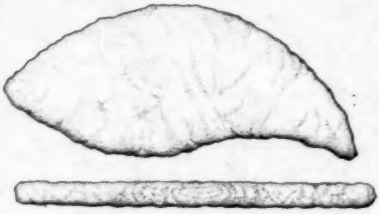


inflatably distending a modulated sunlight directing surface in a second distensible means in order to transmit the data modulated sunlight.

DESIGNS

JULY 19, 1983

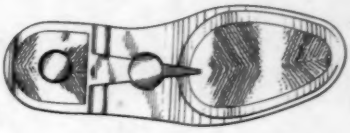
269,729
MOLDED MEAT PRODUCT OR SIMILAR ARTICLE
Martin B. P. Zonnenberg, Old Oakwood Rd., Oakwood, Ga. 30566
Filed Oct. 29, 1980, Ser. No. 202,535
Term of patent 14 years
Int. Cl. D01—*04*
U.S. Cl. D1—26



269,730
BRASSIERE
Flavia DiTullio, New York, N.Y., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed May 4, 1981, Ser. No. 260,052
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24

269,731
AFTER SKI BOOT
Mario Mattiuzzo, Treviso, Italy, assignor to Nordica S.P.A., Montebelluna, Italy
Filed May 26, 1981, Ser. No. 267,115
Claims priority, application Italy, Dec. 18, 1980, 23678/80[U]
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—275

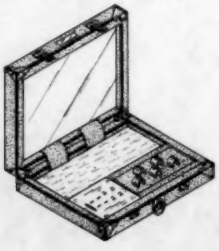
269,732
SHOE BOTTOM
Joseph P. Famolare, Jr., Putney, Vt., assignor to Famolare, Inc., New York, N.Y.
Filed Mar. 24, 1981, Ser. No. 247,513
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—319



269,733
CANE
Margaret E. Ayres, 33 Leroy St., Binghamton, N.Y. 14892
Filed Nov. 24, 1980, Ser. No. 209,384
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D3—7

269,734
KNITTING NEEDLE
Hidekazu Okada, Ashiya, Japan, assignor to Clover Mfg. Co., Ltd., Osaka, Japan
Filed Dec. 19, 1979, Ser. No. 105,088
Claims priority, application Japan, Nov. 12, 1979, 54-47495
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D3—28

269,735
COMPARTMENTED TRAVEL CASE
Brian T. Bunetta, 19981 Carrie, Detroit, Mich. 48234
Filed Feb. 12, 1981, Ser. No. 233,737
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—39

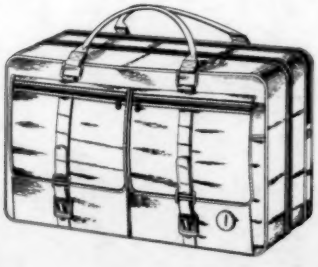


269,736
LUGGAGE
Ted Stark, Jersey City, N.J., assignor to M/M Verdi International, Inc., Jersey City, N.J.
Filed Apr. 7, 1982, Ser. No. 366,285
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

269,737
LUGGAGE
Ted Stark, Montclaire, N.J., assignor to M/M Verdi International, Inc., Jersey City, N.J.
Filed Apr. 7, 1982, Ser. No. 366,298
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

269,738
LUGGAGE
Ted Stark, Montclaire, N.J., assignor to M/M Verdi International, Inc., Jersey City, N.J.
Filed Apr. 7, 1982, Ser. No. 366,401
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—77

269,739
LUGGAGE
Ted Stark, Montclaire, N.J., assignor to M/M Verdi International, Inc., Jersey City, N.J.
Filed Apr. 7, 1982, Ser. No. 366,403
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71



269,740
LUGGAGE
Ted Stark, Montclaire, N.J., assignor to M/M Verdi International, Inc., Jersey City, N.J.
Filed Apr. 7, 1982, Ser. No. 366,405
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

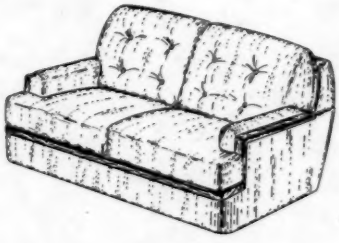
269,741
LUGGAGE
Ted Stark, Montclaire, N.J., assignor to M/M Verdi International, Inc., Jersey City, N.J.
Filed Apr. 7, 1982, Ser. No. 366,406
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

269,742
CRIB
Merlin A. Brunner, New London; Harvey J. Drabeim, Weyauwega, and Michael J. Schaffer, New London, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Feb. 25, 1981, Ser. No. 238,245
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—16

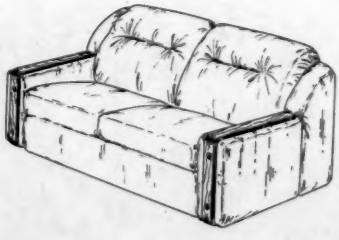
269,743
CHAIR
Wolfgang Müller-Deisig, Borgenteich, Fed. Rep. of Germany, assignor to Fehlbaum & Co., Dornach, Switzerland
Filed Dec. 3, 1980, Ser. No. 212,467
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

269,744
CHAIR
Frederick J. Wallace, Salisbury, N.C., assignor to Lyon-Shaw, Inc., Salisbury, N.C.
Filed Jul. 10, 1981, Ser. No. 281,991
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

269,745
SETTEE
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Jan. 7, 1982, Ser. No. 337,607
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



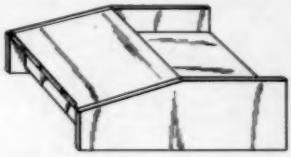
269,746
SETTEE
Richard Brooks, North Hollywood, Calif., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Feb. 8, 1982, Ser. No. 346,579
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



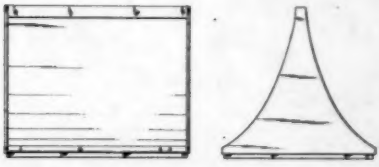
269,747
SEAT
Frederick J. Wallace, Salisbury, N.C., assignor to Lyon-Shaw Incorporated, Salisbury, N.C.
Filed Jul. 10, 1981, Ser. No. 281,990
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—70

269,748
CHAIR
France Berlic, Rozna dolina c. III/5, 61000 Ljubljana, Yugoslavia
Filed Dec. 29, 1980, Ser. No. 221,042
Claims priority, application Yugoslavia, Nov. 5, 1980, 416/80
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—76

269,749
CRT TERMINAL STAND
Daniel F. Foster, 7160 S. Vine Cir. East, Littleton, Colo. 80122
Filed Jan. 28, 1981, Ser. No. 229,288
Term of patent 14 years
Int. Cl. D6—*04*; D14—*02*
U.S. Cl. D6—85

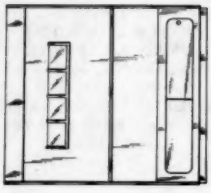


269,750
DISPLAY STAND FOR FLOOR TILES, CARPETS OR SIMILAR ARTICLE
Anthony E. Bolyn, Verona, N.J., assignor to Congoleum Corporation, Kearny, N.J.
Filed Dec. 17, 1980, Ser. No. 217,487
Term of patent 14 years
Int. Cl. D06—*06*
U.S. Cl. D6—85

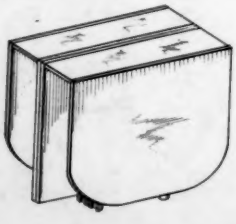


269,751
CADDY FOR ASSEMBLED RODS AND REELS
Paul F. Rieman, 4390 E. Broadway, Des Moines, Iowa 50317
Filed May 7, 1981, Ser. No. 261,635
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—125

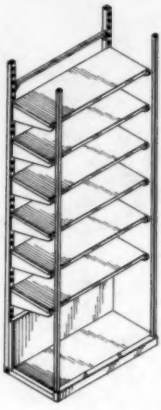
269,752
DISPLAY CABINET FOR FLOOR TILES, CARPETS OR SIMILAR ARTICLE
Anthony E. Bolyn, Verona, N.J., assignor to Congoleum Corporation, Kearny, N.J.
Filed Dec. 17, 1980, Ser. No. 217,372
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—168



269,753
COLLAPSIBLE TABLE
Giovanni Offredi, Via L. Murator 29, Milano, Italy
Filed Apr. 13, 1981, Ser. No. 253,246
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—178

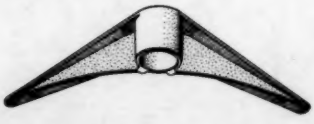


269,754
DISPLAY UNIT
Fred W. Kates, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Jan. 7, 1981, Ser. No. 223,180
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—186



269,755
FRONT AND SIDE PANELS OF A DESK
Amerigo Terenzoni, 400 S. Western, Oklahoma City, Okla. 73109
Filed Sep. 12, 1980, Ser. No. 186,553
Term of patent 14 years
Int. Cl. D06—*06*
U.S. Cl. D6—192

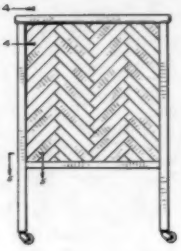
269,756
SUPPORT BRACKET FOR A TABLE LEG
Edwin C. Sandham, Thiensville, Wis., assignor to Nordson Corporation, Amherst, Ohio
Filed Mar. 16, 1981, Ser. No. 244,157
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194



269,757
CRIB FOOTBOARD

Merlin A. Brunner, New London; Harvey J. Drabeim, Weyauwega, and Michael J. Schaffer, New London, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,339
Term of patent 14 years
Int. Cl. D6—*D6*
U.S. Cl. D6—198



269,758
BAR-B-QUE SHELL

Charles A. Braswell, Burnet, Tex., assignor to Jaro, Inc., Burnet, Tex.

Filed Oct. 5, 1981, Ser. No. 308,930
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—337

269,759
DRIVE FASTENER SHANK

Burnell J. Wollar, Barrington, Ill., assignor to Phillips Plastics Corp., Phillips, Wis.

Filed Jul. 22, 1980, Ser. No. 171,025
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—388

269,760
SECURING DEVICE FOR A GENERATOR FIXED BY A SLIDEWAY ON SEAT-STAYS OF A BICYCLE

Gilbert Geney, Seloncourt, France, assignor to Cycles Peugeot, Valentigney, France

Filed Feb. 8, 1980, Ser. No. 120,122
Claims priority, application France, Feb. 8, 1980, 80 387
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382

269,761
CAN OR THE LIKE

Thomas N. Gaunt, Leeds, England, assignor to Plastona (John Waddington) Limited, Leeds, England

Filed Dec. 3, 1980, Ser. No. 212,486
Claims priority, application United Kingdom, Aug. 12, 1980, 996105
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

269,762
BOTTLE
Andrew Grant, Markham, Canada, assignor to BP Oil Limited, Toronto, Canada
Filed Nov. 10, 1980, Ser. No. 205,474
Claims priority, application Canada, Jul. 14, 1980, 1407804
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—375

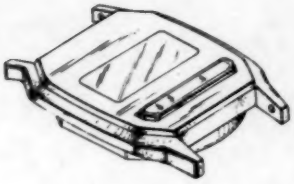
269,763
PACKAGING CONTAINER
Vincent E. Fortuna, Garden Grove, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed Apr. 13, 1981, Ser. No. 253,810
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—398

269,764
PACKAGING CONTAINER
Vincent E. Fortuna, Garden Grove, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed Apr. 13, 1981, Ser. No. 253,812
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—398

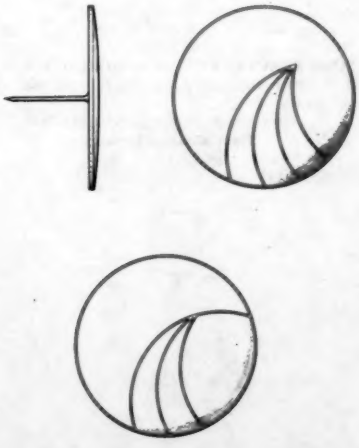
269,765
PACKAGING CONTAINER
Vincent E. Fortuna, Garden Grove, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed Mar. 23, 1981, Ser. No. 246,885
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—398

269,766
DISPLAY CARD FOR JEWELRY ARTICLES OR THE LIKE
Andrew G. Strasser, Woodcliff Lake, N.J.; Donna M. Tierney, and Daniel B. Thorsen, both of Bronxville, N.Y., assignors to General Mills Products Corp., Minneapolis, Minn.
Filed May 4, 1981, Ser. No. 260,137
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—457

269,767
DIGITAL WATCH
John T. Houlihan, Watertown, and John S. Maliskas, Newtown, both of Conn., assignors to Timex Corporation, Waterbury, Conn.
Filed Apr. 14, 1981, Ser. No. 254,033
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

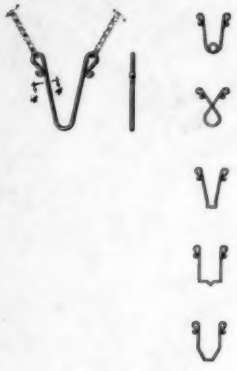


269,768
SYMBOLIC PIN
Peter A. Terry, 6315 Colony Way, Edina, Minn. 55435
Filed Mar. 9, 1981, Ser. No. 241,841
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—47

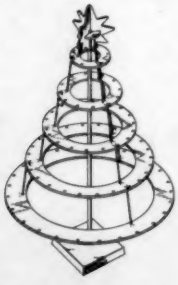


269,769
SEGMENTED TURTLE-SHAPED PENDANT OR SIMILAR ARTICLE
Muriel Meyer, Long Beach, N.Y., assignor to General Mills Products Corp., Minneapolis, Minn.
Filed Apr. 22, 1981, Ser. No. 256,444
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—82

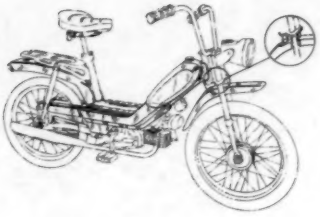
269,770
JEWELRY CHAIN CLASP
James E. Pittenger, 2427 S. Allison Way, Lakewood, Colo. 80227, and William S. Worth, 2855 E. Maplewood, Littleton, Colo. 80120
Filed Sep. 30, 1980, Ser. No. 192,459
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—87



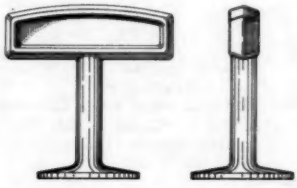
269,771
SIMULATED CHRISTMAS TREE
Cole Williams, 2408 Allanjay Pl., Glendale, Calif. 91208
Filed Jul. 27, 1981, Ser. No. 287,512
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—118



269,772
COMBINED FRONT AND REAR FENDERS, CHAIN GUARD, ENGINE COVER AND FUEL TANK FOR MOPED
Daniel G. Hahn, Olney, Ill., assignor to AMF Incorporated, White Plains, N.Y.
Filed Sep. 8, 1980, Ser. No. 184,703
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110

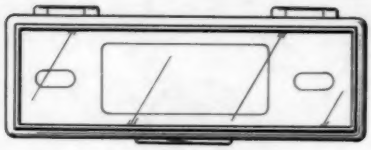


269,773
COMPRESSION TOOL FOR INSIDE TIRE REPAIR OR SIMILAR ARTICLE
Alec W. Niconchuk, Peabody, Mass., assignor to North Shore Laboratories Corp., Peabody, Mass.
Filed Jul. 7, 1980, Ser. No. 166,563
Term of patent 14 years
Int. Cl. 12—*99*
U.S. Cl. D12—153

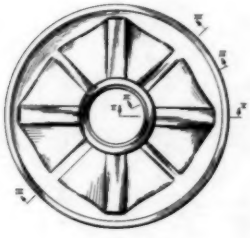


269,774
SUPPORT BRACKET FOR AUTOMOTIVE ROOF RACK
Joseph W. Schawarzli, 430 Comstock Rd., Scarborough, Ontario, Canada
Filed Feb. 5, 1981, Ser. No. 231,628
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

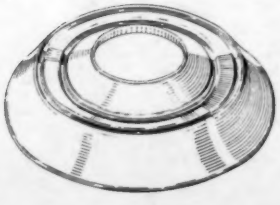
269,775
MOTORCYCLE RADIO COVER
Fred O. Hoese, 30706 Wildcat Dr., Bulverde, Tex. 78163
Filed Aug. 13, 1980, Ser. No. 177,865
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—192



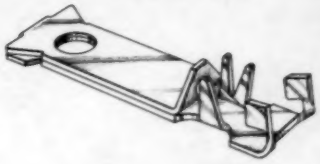
269,776
WHEEL CENTER
Donald F. Morgan, 133 E. Central, Zeeland, Mich. 49464
Filed Oct. 20, 1980, Ser. No. 198,917
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—204



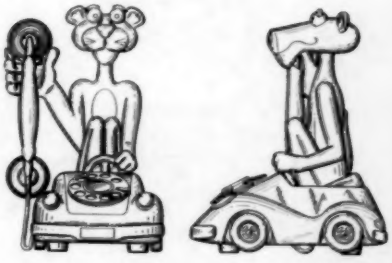
269,777
DIAPHRAGM PLATE FOR A SERVOMOTOR
Robert L. Williams, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.
Filed Dec. 19, 1980, Ser. No. 217,972
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D13—1



269,778
POLARIZED TERMINAL BLADE
Donald G. McGregor, 98 Power Rd., Pawtucket, R.I. 02860
Filed Sep. 15, 1980, Ser. No. 187,219
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

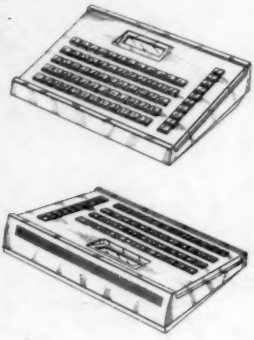


269,779
TELEPHONE
John E. Bevilacqua, Jr., and James E. Ross, both of Charlottesville, Va., assignors to United Artists Corporation, New York, N.Y.
Filed Jan. 7, 1981, Ser. No. 223,105
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



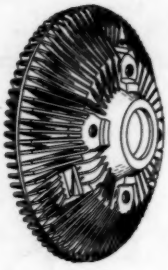
269,780
INTERCOM SPEAKER AND RECEIVER
Peter J. Doodson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 27, 1979, Ser. No. 79,629
Claims priority, application United Kingdom, Apr. 2, 1979, 989299
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—57

269,781
TELEPHONE BUSY LAMP FIELD CONSOLE WITH DISPLAY
Donald A. Foggia, Ocean, N.J.; Deepak R. Muzumdar, Boca Raton, Fla.; Gerhart F. Klaiber, Boca Raton, Fla., and Rolf E. Schneider, Boca Raton, Fla., assignors to Siemens Corporation, Iselin, N.J.
Filed Oct. 23, 1980, Ser. No. 199,991
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—58

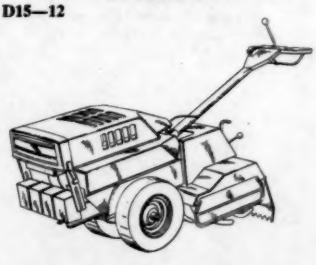


269,782
PRINTER
Daniel Canning, Dublin, and James B. Jordan, Berkeley, both of Calif., assignors to Qume Corporation, San Jose, Calif.
Filed Nov. 3, 1980, Ser. No. 203,522
Term of patent 14 years
Int. Cl. D14—*02*; D18—*02*
U.S. Cl. D14—111

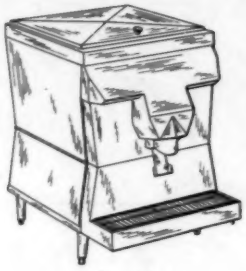
269,783
HOUSING OF A VISCOUS FAN DRIVE
Richard W. Heater, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Jun. 27, 1980, Ser. No. 163,598
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—5



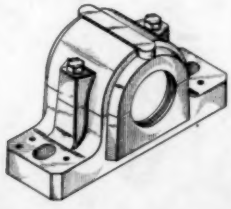
269,784
AGRICULTURAL TILLER
Philip D. Stark, Kankakee, Ill., assignor to Roper Corporation, Kankakee, Ill.
Filed Sep. 17, 1980, Ser. No. 188,138
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12



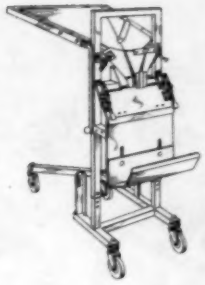
269,785
SANITARY COUNTERTOP MACHINE FOR STORING AND DISPENSING PARTICULATE ICE
Charles M. Lents, Leon Valley, Tex., assignor to Stainless Ice-Tainer Company, San Antonio, Tex.
Filed Mar. 23, 1981, Ser. No. 246,468
Term of patent 14 years
Int. Cl. D15—*08, 07*
U.S. Cl. D15—80



269,786
BEARING HOUSING
Sture Ostling, Katrineholm, Sweden, assignor to AB SKF, Gothenburg, Sweden
Filed Jan. 16, 1981, Ser. No. 225,852
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—143

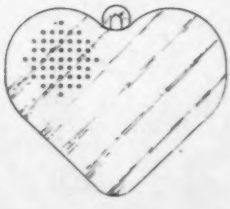


269,787
BAG FILLING DEVICE
Jerry W. Cramer, Upland, Calif., assignor to Sunkist Growers, Inc., Sherman Oaks, Calif.
Filed Feb. 2, 1981, Ser. No. 230,734
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—145

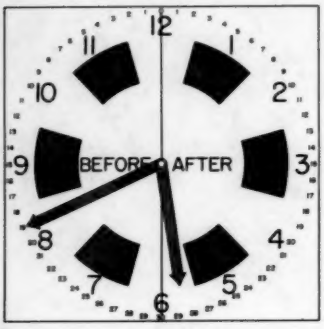


269,788
GUITAR
Wallace J. LeBlue, 3455 Pine, Beaumont, Tex. 77703
Filed Jun. 1, 1981, Ser. No. 269,112
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14

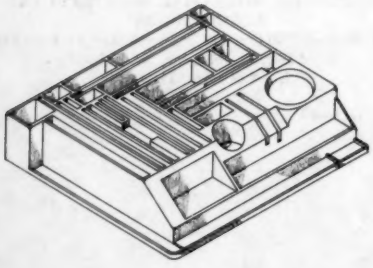
269,789
HOUSING FOR SIMULATING HEARTBEAT AND WOMB SOUNDS
Todd D. Monson, 2090 Cresthill Dr., Salt Lake City, Utah 84117
Filed Dec. 12, 1980, Ser. No. 216,007
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—59



269,790
TEACHING CLOCK
Frank Alessio, 1572-79th St., Brooklyn, N.Y. 11228
Filed Mar. 31, 1981, Ser. No. 249,706
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—64



269,791
COMPARTMENTED TRAY FOR DRAFTING SUPPLIES
Richard W. Chatham, P.O. Box 6361, Greensboro, N.C. 27405
Filed Jun. 26, 1981, Ser. No. 277,938
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—77



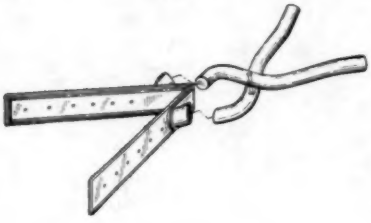
269,792
HOOP ROLLER
Benjamin T. Baser, 460 N. 48th St., Springfield, Oreg. 97477
Filed Oct. 30, 1980, Ser. No. 202,064
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—101

269,793
PLAYHOUSE
David L. Giveans, San Francisco, Calif., assignor to SB/JP Enterprises, Inc., San Francisco, Calif.
Filed Mar. 30, 1981, Ser. No. 249,163
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—114

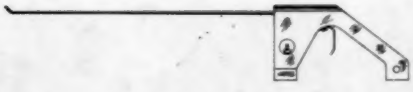
269,794
BALL CATCHING AND THROWING DEVICE
Homer C. Amos, Palm Springs, Calif., assignor to Brunswick Corporation, Skokie, Ill.
Filed Jun. 10, 1980, Ser. No. 158,337
The portion of the term of this patent subsequent to Jun. 28, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—210

269,795
BALL CATCHING AND THROWING DEVICE
Homer C. Amos, Palm Springs, Calif., assignor to Brunswick Corporation, Skokie, Ill.
Filed Jun. 10, 1980, Ser. No. 158,334
The portion of the term of this patent subsequent to Jun. 28, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—210

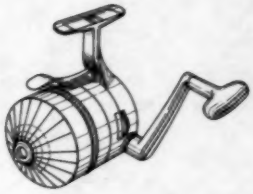
269,796
INSECT CATCHING DEVICE OR THE LIKE
Michael J. Stringfellow, Bend, Oreg., assignor to Carl Dudrey, St. Johns, Kans.
Filed Jan. 12, 1981, Ser. No. 224,213
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—20



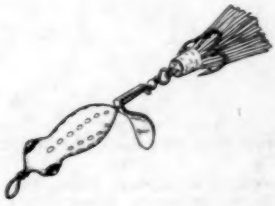
269,797
ICE FISHING ROD
Douglas D. Riis, Marion, Iowa
Filed Mar. 16, 1981, Ser. No. 244,008
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23



269,798
FISHING REEL
Robert W. Fee, Wichita; Richard J. Robbins, Derby, both of Kans., and Henry L. Neufeld, Tulsa, Okla., assignors to Brunswick Corporation, Skokie, Ill.
Filed Jul. 28, 1981, Ser. No. 286,751
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



269,799
FISHING LURE
Johnny J. Waller, P.O. Box 91, Checotah, Okla. 74426
Filed Apr. 3, 1981, Ser. No. 250,758
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

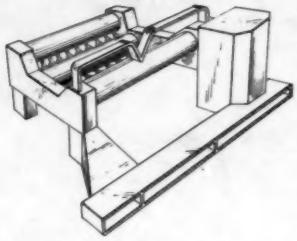


269,800
FISHING LURE
Johnny J. Waller, P.O. Box 91, Checotah, Okla. 74426
Filed Apr. 3, 1981, Ser. No. 250,759
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

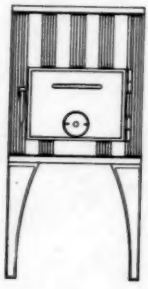
269,801
SWIMMING POOL CHEMICAL DISPENSER OR THE LIKE
Arlon G. Sangster, Sterling, Mass., and Joseph J. Tepas, Jr., Easton, Conn., assignors to Olin Corporation, New Haven, Conn.
Filed Apr. 24, 1981, Ser. No. 257,051
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—03

269,802
SWIMMING POOL CHEMICAL DISPENSER OR THE LIKE
Roy P. Alexander, Killingworth, Conn.; Arlon G. Sangster, Sterling, Mass., and Joseph C. Green, Milford, Conn., assignors to Olin Corporation, New Haven, Conn.
Filed Apr. 24, 1981, Ser. No. 257,052
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—03

269,803
FIREPLACE GRATE
David Anderson, 1311 E. Main St., St. Charles, Ill. 60174
Filed Jan. 2, 1981, Ser. No. 221,985
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—95



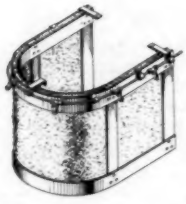
269,804
STOVE
Winston J. F. Sorensen, Rudkobing, Denmark, assignor to Danish Stove Association, ApS, Odense, Denmark
Filed Nov. 19, 1980, Ser. No. 208,294
Claims priority, application Denmark, May 23, 1980, 408/80
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



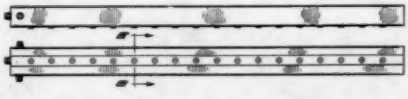
269,805
FUEL LOADER FOR LOADING FUEL SUCH AS WOOD LOGS INTO WOOD BURNING STOVES
Eugene V. Stair, Rte. 1, Caddo, Okla. 74729
Filed May 29, 1981, Ser. No. 268,137
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—125

269,806
WARMING SHELF FOR A PARLOR STOVE
Duncan C. Syme, Chelsea, Vt., assignor to Vermont Castings, Inc., Randolph, Vt.
Filed Mar. 30, 1981, Ser. No. 248,811
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127

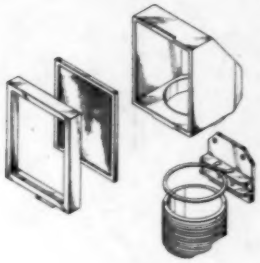
269,807
AIR PRE-COOLER UNIT FOR AIR CONDITIONERS OR THE LIKE
William E. Morrow, and Robert B. Morrow, both of Winston-Salem, N.C., assignors to Aqua-Mist, Inc., Winston-Salem, N.C.
Filed Jul. 16, 1981, Ser. No. 283,840
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



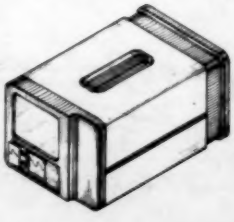
269,808
HUMIDIFIER DISPERSION TUBE
Bernard W. Morton, Minnetonka, Minn., assignor to Dri Steem Humidifier Company, Hopkins, Minn.
Filed Dec. 2, 1980, Ser. No. 212,212
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—146



269,809
COMBINED PORTABLE VENT AND SUPPORT FOR A CLOTHES DRYER
Charles W. Chadd, 13119 Hermitage La., Houston, Tex. 77009
Filed Aug. 25, 1980, Ser. No. 181,195
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—151



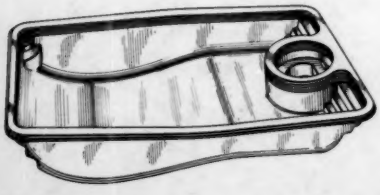
269,810
PHYSIOLOGICAL SIGNALS MONITOR/RECORDER OR THE LIKE
Leslie E. Mace, Bothell; Paul W. Jones, Issaquah, and Robert M. Boonstra, Kent, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.
Filed Mar. 18, 1981, Ser. No. 244,920
Term of patent 14 years
Int. Cl. D24—*01, 02*
U.S. Cl. D24—17



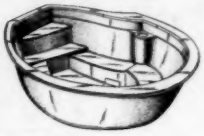
269,811
SWABBING STICK
Jack W. Kaufman, 357 Frankel Blvd., Merrick, N.Y. 11566
Filed Feb. 27, 1980, Ser. No. 125,149
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—34

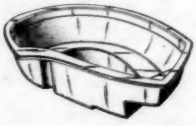
269,812
CHIROPRACTIC ACTIVATOR
William E. Lancellotti, 371 Broadway, Providence, R.I. 02903
Filed Oct. 6, 1980, Ser. No. 193,917
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—36

269,813
COMBINED HYDROTHERAPY SPA AND SWIMMING POOL
Lino Z. Topete, 1845 E. San Antonio St., San Jose, Calif. 95116
Filed Aug. 18, 1980, Ser. No. 179,115
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02;* D25—*99*
U.S. Cl. D24—38



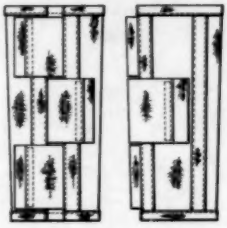
269,814
SPA
Gerald C. Fishel, Anaheim; Harold E. Cowley, Garden Grove, and Dean W. Myers, Santa Ana, all of Calif., assignors to Gerico Fiberglass Products, Inc., Huntington Beach, Calif.
Filed Oct. 20, 1980, Ser. No. 198,959
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02;* D25—*99*
U.S. Cl. D24—38





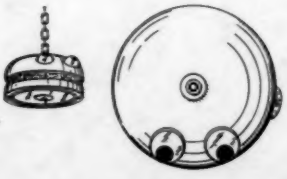
269,815
PACIFIER
Robert L. Qually, 2238 Central St., Evanston, Ill. 60201
Filed Dec. 18, 1980, Ser. No. 217,959
Term of patent 14 years
Int. Cl. 24—*04*
U.S. Cl. D24—45

269,816
SHIN SPLINT
Robert H. Meier, and Evelyn Farr, both of Jackson, Mich., assignors to Camp International, Inc., Jackson, Mich.
Filed Feb. 2, 1981, Ser. No. 230,328
Term of patent 14 years
Int. Cl. 24—*03*
U.S. Cl. D24—64

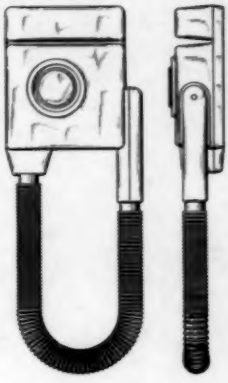


269,817
AIRCRAFT TAIL POSITION LIGHT
James F. Frazier, Westbrook, Conn., assignor to Whelen Engineering Company, Inc., Deep River, Conn.
Filed Nov. 6, 1980, Ser. No. 204,572
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—35

269,818
LIGHT FIXTURE
Donald S. Ament, Encino, Calif., assignor to Miracle Recreation Equipment Company, Grinnell, Iowa
Filed Jul. 17, 1980, Ser. No. 169,803
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—73

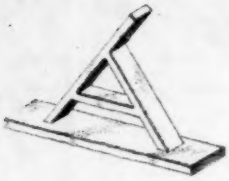


269,819
WALL MOUNTED HAIR DRYING DEVICE
Jean-Marie Froidevaux, Carouge, Switzerland, assignor to Aliseo Diffusion S.A., Switzerland
Filed Apr. 17, 1981, Ser. No. 255,315
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—12



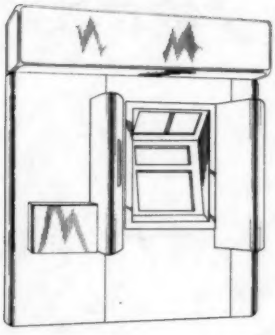
269,820
HAIRDRESSER COMB
Nicole Bisson, Laval, Canada, assignor to Salon Nicole Bisson Inc., Montreal, Canada
Filed Jul. 20, 1981, Ser. No. 285,369
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—25

269,821
COMBINED CAT PLAYGROUND AND EXERCISER
Merle Hurley, 1362 E. Main, #4, El Cajon, Calif. 92021
Filed Jul. 13, 1981, Ser. No. 283,052
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—42



269,822
AUTOMATIC TELLER MACHINE KIOSK
John E. Barthel, Dallas, Tex., assignor to Dahl-Braden, Chapman Architects, Inc., Dallas, Tex.
Filed May 26, 1981, Ser. No. 266,894
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—28

269,823
AUTOMATIC TELLER MACHINE BOOTH FOR MOUNTING ON A WALL
John E. Barthel, Dallas, Tex., assignor to First International Services Corporation, Dallas, Tex.
Filed Jul. 13, 1981, Ser. No. 283,029
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—28



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF JULY, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Aoki & Associates: *See*—
Satoh, Kiyosumi; and Watanabe, Nobuyuki, 4,394,735, Cl. 364-200.000.

A.P.V. Company Limited, The: *See*—
Cattell, Graham S.; and Brittain, John E., 4,393,755, Cl. 99-348.000.

A/S Raufoss Ammunisjonsfabrikker: *See*—
Hartvig, Tor; and Fjellheim, Petter, 4,394,168, Cl. 75-126.00A.

AAA Sales & Engineering, Inc.: *See*—
Mazur, Michael B.; and Punko, Emil M., 4,393,960, Cl. 188-62.000.

Aarding Weerstandlas B.V.: *See*—
Loggers, Hendrik, 4,394,176, Cl. 106-120.000.

Abbott, Robert P. Register-pin-locating device. 4,393,593, Cl. 33-184.500.

Abe, Koreyoshi: *See*—
Yamamoto, Toshiharu; Sato, Manabu; Akiba, Katsuya; and Abe, Koreyoshi, 4,393,540, Cl. 16-114.00R.

Accettura, Albert; and Accettura, Wanda J. Aluminum can compactor. 4,393,765, Cl. 100-98.00R.

Accettura, Wanda J.: *See*—
Accettura, Albert; and Accettura, Wanda J., 4,393,765, Cl. 100-98.00R.

Acda, Petrus M.; and Karreman, Jacob, to Polva Nederland B.V. Process for the forming of coupling pieces from a thermoplastic. 4,394,343, Cl. 264-296.000.

Ace Fishing & Rental Tools, Inc.: *See*—
Cooper, Larry V.; and Sloane, Michael W., Sr., 4,393,940, Cl. 166-325.000.

Ace Orthopedic Manufacturing Inc.: *See*—
Teague, H. Derek, 4,393,868, Cl. 128-92.00A.

ACF Industries, Incorporated: *See*—
Binegar, Scott W.; and Saka, Hamid J., 4,393,889, Cl. 137-72.000.
Polley, Richard B., 4,394,002, Cl. 251-144.000.
Ried, Harold T.; and Weaver, Edgar C., 4,394,195, Cl. 148-149.000.

Aciers et Outillage Peugeot: *See*—
Schmidt, Yves, 4,393,557, Cl. 24-230.00A.

Acker, Alvin W., to Allis-Chalmers Corporation. Hydraulic stabilizer for axle on mast lift vehicle. 4,393,959, Cl. 187-9.00E.

Ackland, John: *See*—
Gugger, Hans; and Ackland, John, 4,393,944, Cl. 173-28.000.

Ackley, Charles E., Jr.: *See*—
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,393,973, Cl. 198-384.000.

Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., to R. W. Hartnett Company. Method and apparatus for removing non-rectified capsules from a capsule rectification and transport device. 4,393,973, Cl. 198-384.000.

Acraloc Corporation: *See*—
Ailey, Harrison A., Jr., 4,393,627, Cl. 51-246.000.

Adams, Edgar L.; and Ludington, William D. Carpet take-up device and method for using the same. 4,394,052, Cl. 299-18.000.

Adams, Richard G., to Pennwalt Corporation. Determination of grain refiners in phosphate conversion coating baths. 4,394,184, Cl. 148-6.15R.

Adermann, Peter: *See*—
Jenkner, Herbert; Strang, Robert; and Adermann, Peter, 4,394,484, Cl. 525-72.000.

Adkins, James: *See*—
McAfee, Richard C.; Adkins, James; and Miskowski, Richard L., 4,394,317, Cl. 260-429.00R.

Adnovum AG: *See*—
Clark, John F., 4,394,242, Cl. 204-243.00R.

Adrian, David L., to Lens-Card Systems, Inc. Card carrying microfilm and associated reading lens and process of forming same. 4,393,610, Cl. 40-625.000.

Adrian, Renate: *See*—
Maurer, Alexander; Adrian, Renate; Panter, Herbert; Heymer, Gero; and Nolker, Dieter, 4,394,358, Cl. 423-305.000.
Wasel-Nielen, Horst-Dieter; Maurer, Alexander; and Adrian, Renate, 4,394,359, Cl. 423-305.000.

Adur, Ashok M., to Chemplex Company. Four component adhesive blends and composite structures. 4,394,485, Cl. 525-74.000.

Aerosol Inventions and Development AS AID SA: *See*—
Debard, Andre, 4,393,984, Cl. 222-402.180.

Agency of Industrial Science & Technology: *See*—
Ogasa, Tatsuo, 4,394,457, Cl. 521-54.000.

Agfa-Gevaert, N.V.: *See*—
Peeters, Hugo K., 4,394,661, Cl. 346-1.100.
Plessers, Hendrik S.; and Hellemans, Julianus J., 4,393,642, Cl. 53-266.00R.

Aggarwal, Raj K.: *See*—
Mehra, Ravinder C.; and Aggarwal, Raj K., 4,394,266, Cl. 210-244.000.

Agnus Chemical Company: *See*—
Barnhard, Philip, IV; and Bahr, Lyman G., 4,394,199, Cl. 149-21.000.

Agouridis, Dimitrios C. Photovoltaic radiation detector element. 4,394,676, Cl. 357-29.000.

Aguayo, Arturo J., to Rogers Corporation. Multilayer current distribution systems and methods of fabrication thereof. 4,394,532, Cl. 174-72.00B.

Ahrens, Claude W., to Miracle Recreation Equipment Company. Swing farrowing hut and method of farrowing pigs and maintaining a disease - free farrowing hut. 4,393,812, Cl. 119-16.000.

Aida Engineering, Ltd.: *See*—
Imanishi, Shozo, 4,393,682, Cl. 72-405.000.

Ailey, Harrison A., Jr., to Acraloc Corporation. Reversing screw/high-low speed level wind screw. 4,393,627, Cl. 51-246.000.

Air-Mo Hydraulics, Inc.: *See*—
Rasmussen, Robert, 4,393,674, Cl. 72-61.000.

Air-O-Scoop Corporation: *See*—
Chatlos, Richard, 4,393,753, Cl. 98-2.120.

Air Products and Chemicals, Inc.: *See*—
Ford, Michael E.; and Johnson, Thomas A., 4,394,524, Cl. 564-479.000.
Fukushima, Hatahiko; Handa, Tadahiko; and Kodama, Kenji, 4,394,333, Cl. 264-37.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Komorizono, Junichi, 4,393,655, Cl. 60-585.000.
Sakurai, Kenji; and Yoshimura, Noboru, 4,394,048, Cl. 297-367.000.

Akashi, Tamotsu: *See*—
Sawaoka, Akira; Araki, Masatada; Saito, Shinroku; and Akashi, Tamotsu, 4,394,170, Cl. 75-233.000.

Akashi, Toshihiro: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,394,382, Cl. 424-283.000.

Akiba, Katsuya: *See*—
Yamamoto, Toshiharu; Sato, Manabu; Akiba, Katsuya; and Abe, Koreyoshi, 4,393,540, Cl. 16-114.00R.

Akimov, Boris I.: *See*—
Azarevich, Gennady M.; Gusyatsky, Iosif A.; Savelieva, Lidia B.; and Akimov, Boris I., 4,393,675, Cl. 72-71.000.

Akkerman, Johannes: *See*—
Kuibers-Kiewik, Walfrida G. E.; Akkerman, Johannes; and Goss, Johan, 4,394,501, Cl. 528-485.000.

Akkerman, Neil H., to AVA International. Well packers and slip assemblies for use therewith. 4,393,929, Cl. 166-134.000.

Aktiebolaget Bofors: *See*—
Gustavsson, Olle; and Sundmar, Goran, 4,393,747, Cl. 89-45.000.
Hallqvist, Sten; and Eriksson, Erik, 4,393,748, Cl. 89-47.000.

Akzo N.V.: *See*—
Werner, Marcel A.; Vesema, Arnold; and Pisters, Michael G. H., 4,394,470, Cl. 524-56.000.

Alberti, Rosette. Power circuit-breaker with remote-controllable operation threshold. 4,394,585, Cl. 307-140.000.

Alcan International Limited: *See*—
Gnyra, Bohdan, 4,394,365, Cl. 423-485.000.

Alexander, William H., to Vapor Corporation. Lubricated split plug valve. 4,393,893, Cl. 137-246.120.

Alfa Romeo, S.p.A.: *See*—
De Angelis, Giancarlo; Catastini, Alberto; Bassi, Aldo; Rogora, Edoardo; Radaelli, Dario; Bertolosi, Luciano; and Perrone, Francesco, 4,393,836, Cl. 123-417.000.

Algieri, Aldo A.: *See*—
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,394,508, Cl. 546-209.000.

All Temp Engineering Inc.: *See*—
Reprogle, Layton J.; and Reprogle, Truman B., 4,393,537, Cl. 15-348.000.

Allada, Sambasiva R., to Dow Chemical Company, The. Activated ammonium nitrate plastic foam blowing agent. 4,394,288, Cl. 252-350.000.

Allen, Gary F., to Mobay Chemical Corporation. Catalytic hydrogenation of di(4-aminophenyl)methane. 4,394,522, Cl. 564-451.000.

Allen, Gary F., to Mobay Chemical Corporation. Catalytic hydrogenation of di (4-aminophenyl) methane. 4,394,523, Cl. 564-451.000.

Allen, James R.; Allen, John D.; and Knigge, Robert A. Carpet stretching tool. 4,394,004, Cl. 254-204.000.

Allen, John D.: *See*—
Allen, James R.; Allen, John D.; and Knigge, Robert A., 4,394,004, Cl. 254-204.000.

Allen, Walter E.; and Wilson, Douglas D., to Tramamerica DeLaval Inc. Tube clamp. 4,393,998, Cl. 248-74.00R.

Allied Corporation: *See*—
Chung, Daniel C.; Miller, William A.; and Baumgaertner, Eugene R., 4,394,460, Cl. 521-92.000.
Mas, Joseph A., 4,394,597, Cl. 310-268.000.
Mattson, Richard W., 4,394,648, Cl. 340-679.000.

Allis-Chalmers Corporation: *See*—
Acker, Alvin W., 4,393,959, Cl. 187-9.00E.
Caddy, John A.; and Putman, William A., 4,394,147, Cl. 55-357.000.
O'Dell, Leonard J., 4,394,143, Cl. 55-261.000.
Wirschal, Helmut H.; and Whippen, Warren G., 4,394,098, Cl. 405-77.000.

Alps Electric Co., Ltd.: *See*—
Harumatsu, Masatoshi; Tomoyori, Makoto; and Tsushima, Noboru, 4,393,709, Cl. 73-505.000.
Harumatsu, Masatoshi, 4,394,546, Cl. 200-5.00R.

Amano Corporation: *See*—
Kato, Hiroshi; Ato, Hisataka; Inagaki, Osamu; and Matsuo, Hiroshi, 4,394,666, Cl. 346-82.000.

Amano, Toshio; Nagai, Kunio; and Honma, Juri, to Sony Corporation. Remote control system. 4,394,691, Cl. 358-194.100.

Amemiya, Norio: *See*—
Nishikawa, Masaji; Amemiya, Norio; Yasuda, Tadahiro; and Nakayama, Shigeru, 4,394,427, Cl. 430-68.000.

American Commercial Barge Line Co.: *See*—
Nivin, James E., 4,393,888, Cl. 114-201.00R.

American Cyanamid Company: *See*—
Fischer, Robert G., Jr.; and Zweig, Arnold, 4,394,527, Cl. 570-143.000.
Pfeiffer, Ronald E.; and DeMaria, Francesco, 4,394,339, Cl. 264-177.00F.
Schenkel, Robert H., 4,394,388, Cl. 424-304.000.
Wang, Samuel S.; and Scanlon, Michael J., 4,394,257, Cl. 209-166.000.

American Home Products Corporation: *See*—
Commons, Thomas J.; and Potoski, John R., 4,394,504, Cl. 544-28.000.

American Hospital Supply Corporation: *See*—
White, Fred K., 4,393,882, Cl. 128-764.000.

American Standard, Inc.: *See*—
Briner, Clifton F.; Bocchini, William R.; and Wilcockson, Brian, 4,393,524, Cl. 4-317.000.
Nolden, Werner, 4,393,523, Cl. 4-192.000.

Ameyama, Minoru, to Ricoh Company, Ltd. Ink jet printing apparatus. 4,394,663, Cl. 346-75.000.

AMF Incorporated: *See*—
Feil, Paul G., 4,394,553, Cl. 200-67.0DA.
Hargett, Francis B., 4,393,800, Cl. 112-265.100.

AMP Incorporated: *See*—
Cherian, Gabriel B., 4,393,581, Cl. 29-827.000.
Dola, Frank P., 4,394,548, Cl. 200-6.00A.
Hall, Leslie C., Jr., 4,393,580, Cl. 29-749.000.
Reynolds, Charles E., 4,394,059, Cl. 339-125.00R.

Amtech Patent Licensing Corp.: *See*—
Manber, Solomon; Chiang, David; and Chu, Mosi, 4,394,076, Cl. 354-5.000.

Anagnostopoulos, Constantine N.; and Lee, Teh-Hsung, to Eastman Kodak Company. Transparent asymmetric electrode structure for charge coupled device image sensor. 4,394,675, Cl. 357-24.000.

Andco Actuator Products, Inc.: *See*—
Zouzoulas, John, 4,393,965, Cl. 192-48.910.

Anderson, Cary R. Thermal energy meter. 4,393,919, Cl. 165-11.00R.

Anderson, Charles N.; Elrod, Samuel D.; and Miller, Gerald O., to Boeing Company, The. Superplastically formed structure and method of making. 4,393,987, Cl. 228-157.000.

Anderson, Forest L.; and Nation, Robert H. Waste heat recovery system for an internal combustion engine. 4,393,656, Cl. 60-618.000.

Anderson, Kenneth W., to Anderson Seal Company, Inc. Pipe compression seal for bell and spigot joint. 4,394,025, Cl. 277-207.00A.

Anderson, Richard J.; and Leippe, Michael M., to Nabisco Brands, Inc. Substituted pyridyloxybenzo-2,1,3-oxadiazoles and -thiadiazoles and N-oxides thereof. 4,394,154, Cl. 71-92.000.

Anderson Seal Company, Inc.: *See*—
Anderson, Kenneth W., 4,394,025, Cl. 277-207.00A.

Andersson, Albert, to Stiftelsen Industriellt Utvecklingscentrum. Telescoping carrier for forestry equipment. 4,393,943, Cl. 172-260.500.

Andoh, Masayasu: *See*—
Hashimoto, Takeji; Okumoto, Kiyohumi; and Andoh, Masayasu, 4,393,670, Cl. 66-75.200.

Andress, Harry J., to Mobil Oil Corporation. Liquid hydrocarbon fuel composition. 4,394,135, Cl. 44-71.000.

Andrews, Christopher M., to Ciba-Geigy Corporation. Curing epoxide resins in an aquatic environment. 4,394,492, Cl. 525-504.000.

Angus Chemical Company: *See*—
Egly, Richard S.; and Turnquist, Cecil E., 4,394,220, Cl. 203-42.000.

Anmahian, Al, to Electra Food Machinery, Inc. Food processing apparatus. 4,393,758, Cl. 99-450.600.

Ansell, Philip J.: *See*—
Cheriton, Leslie W.; and Ansell, Philip J., 4,394,175, Cl. 106-90.000.

Antfamco, Inc.: *See*—
Anthony, James R.; and Rush, David M., 4,394,019, Cl. 273-256.000.

Anthony, James R.; and Rush, David M., to Antfamco, Inc. Oil drilling game board. 4,394,019, Cl. 273-256.000.

Anthony, Thomas R., to General Electric Company. Alignment-enhancing feed-through conductors for stackable silicon-on-sapphire wafers. 4,394,712, Cl. 361-411.000.

Aoki, Yoshio, to Kaken Chemical Co., Ltd. Dehumidifying container. 4,394,144, Cl. 55-281.000.

Apgar, Waldo D.; Davis, Charles L.; Emery, Loring D., Jr.; Esselunn, Werner F.; and Holbrook, Walter R., to Western Electric Co., Inc.; and Bell Telephone Laboratories, Inc. Enclosed electrical devices. 4,394,602, Cl. 315-71.000.

Appel, Gernard H. Clover heat exchanger core. 4,393,926, Cl. 165-165.000.

Aqualume, Incorporated: *See*—
Campagna, Thomas G.; D'Andrea, Alfred A., Sr.; and Campagna, Frank, 4,394,716, Cl. 362-158.000.

Araki, Masatada: *See*—
Sawaoka, Akira; Araki, Masatada; Saito, Shinroku; and Akashi, Tamotsu, 4,394,170, Cl. 75-233.000.

Arao, Toshio: *See*—
Ito, Tadahiko; Arao, Toshio; Satoh, Nobuo; and Harada, Hiroshi, 4,394,472, Cl. 524-100.000.

Araujo, Armando A.: *See*—
Osrow, Harold; and Araujo, Armando A., 4,394,410, Cl. 428-43.000.

Armco Inc.: *See*—
Marossy, Gabor; and Mueller, Warren E., 4,393,859, Cl. 126-429.000.

Armour, John S.; Watson, Peter M. F.; and Donne, Graham L., to United Kingdom of Great Britain and Northern Ireland, The Minister of Transport in Her Britannic Majesty's Government of the. Liquid container arranged to limit undesirable drainage. 4,393,980, Cl. 220-85.00S.

Armstrong, Rolfe D., to NCR Corporation. Jump return stack. 4,394,729, Cl. 364-200.000.

Arnold, William S., Jr.; and Tulloss, Joseph C., to Western Electric Company, Inc. Methods of and apparatus for forming a cable core having an internal cable shield. 4,393,582, Cl. 29-828.000.

Aronov, Sergei A.; Bashilov, Vladimir A.; Volkov, Nikolai M.; and Dukhovlinov, Sergei D. Linear a-c generator. 4,394,591, Cl. 310-11.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Miyake, Tetsuya; Takeda, Kunihiko; Onitsuka, Hatsuki; Okuyama, Kazuo; and Shimamura, Yasuki, 4,394,353, Cl. 423-21.500.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Nakamura, Kazuo, 4,394,569, Cl. 250-204.000.

Asahi, Naotatsu; Yamaguchi, Sizuka; and Terakado, Katsuyoshi, to Hitachi, Ltd. Method of processing electrically conductive material by glow discharge. 4,394,234, Cl. 204-164.000.

Asami, Takayoshi; and Sonoi, Hidekazu, to Kabushiki Kaisha Kobe Seiko Sho. Heat exchange apparatus with use of hydrogen storing material. 4,393,924, Cl. 165-104.120.

Asano, Kiyomitsu; Jozuka, Masao; and Kondo, Toshikatsu, to Brother Kogyo Kabushiki Kaisha; and Nippon Telecommunication Engineering Company. Support means for print wire. 4,394,093, Cl. 400-124.000.

Asbury, Charles E.: *See*—
Clausen, Victor H.; and Asbury, Charles E., 4,394,206, Cl. 156-322.000.

Asea AB: *See*—
Collin, Per H., 4,394,163, Cl. 75-11.000.

Ashland Oil, Inc.: *See*—
Fisher, Dennis H., 4,394,528, Cl. 585-14.000.
Gruber, Bruce A.; Langer, Heimo J.; and Dunnavant, William R., 4,394,466, Cl. 523-141.000.

Askov, Alan R.: *See*—
Butler, L. Dennis; and Askov, Alan R., 4,394,103, Cl. 414-24.500.

Association pour la Recherche et le Developpment: *See*—
Renon, Henri; and Richon, Dominique, 4,393,689, Cl. 73-64.200.

Aste, Christian, to Schwamm, Horst; and Pezzei, Friedbert. Sporting and recreational facility slide. 4,394,173, Cl. 104-69.000.

Astronics Corporation: *See*—
Winfield, Mason C., 4,393,911, Cl. 152-158.000.

Atherton, Kim W., to Sundstrand Data Control, Inc. Method of making force transducer flexure. 4,394,405, Cl. 427-58.000.

Ato, Hisataka: *See*—
Kato, Hiroshi; Ato, Hisataka; Inagaki, Osamu; and Matsuo, Hiroshi, 4,394,666, Cl. 346-82.000.

Attelages Lemoine - La Mecano - Soudure Remoise: *See*—
Mijot, Guy; Derycke, Leon; Dienne, Didier; and Martinot, Roger, 4,393,942, Cl. 172-2.000.

Auergesellschaft GmbH: *See*—
Fengler, Hans-Jorg, 4,393,686, Cl. 73-23.000.

Aufdermarsh, Carl A., to Du Pont de Nemours, E. I., and Company. Fluoroelastomer curatives. 4,394,489, Cl. 525-370.000.

August, Peter: *See*—
Huber, Peter; August, Peter; Lampelzammer, Helga; and Primas, Willi, 4,394,518, Cl. 556-424.000.

Aurora Design Associates, Inc.: *See*—
Gardner, James H.; and deNevers, Noel H., 4,393,665, Cl. 62-457.000.

Automation Industries, Inc.: *See*—
Jeffras, Nathaniel B.; and Torgersen, Robert H., 4,393,991, Cl. 239-102.000.
Williams, James; and Wills, Henry K., 4,394,057, Cl. 339-15.000.

Automotive Products Limited: *See*—
Dee, Christopher P., 4,393,968, Cl. 192-98.000.

AVA International: *See—*
Akkerman, Neil H., 4,393,929, Cl. 166-134.000.
Avco Corporation: *See—*
McMurray, John H.; and Miller, Jule, 4,394,347, Cl. 420-453.000.
Azarevich, Gennady M.; Gusyatsky, Iosif A.; Savelieva, Lidia B.; and Akimov, Boris I. Contrivance for the machining of cylindrical surfaces on metal-cutting lathes. 4,393,675, Cl. 72-71.000.
Azona Co., Ltd.: *See—*
Shimizu, Yoshikazu; and Yamaguchi, Kathuhiro, 4,394,416, Cl. 428-341.000.
Bagwell, William H. Safe door assembly. 4,393,790, Cl. 109-76.000.
Bahder, George; and Rabinowitz, Mario, to Electric Power Research Institute, Inc. Cryogenic cable and method of making same. 4,394,534, Cl. 174-15.00S.
Bahr, Lyman G.: *See—*
Barnhard, Philip, IV; and Bahr, Lyman G., 4,394,199, Cl. 149-21.000.
Bahrle, Friedrich; and Wulf, Helmut, to Daimler-Benz Aktiengesellschaft. Engine unit with lubricant cooling. 4,393,922, Cl. 165-41.000.
Baji, Toru: *See—*
Tsukada, Toshihisa; Takasaki, Yukio; Hirai, Tadaaki; Baji, Toru; Yamamoto, Hideaki; Tanaka, Yasuo; Maruyama, Eiichi; and Ishioka, Sachio, 4,394,749, Cl. 365-106.000.
Baker Industries, Inc.: *See—*
Wynne, John M.; and Vogt, William R., 4,394,655, Cl. 340-825.360.
Baker International Corporation: *See—*
Muse, John F.; Callihan, Rudy B.; Goad, Bobby F.; and Wainwright, Clyde S., Jr., 4,393,931, Cl. 166-208.000.
Ross, Richard J.; and Mendez, Luis E., 4,393,930, Cl. 166-188.000.
Balaban, John A. Tennis racket. 4,394,014, Cl. 273-73.00G.
Balasubramanyan, Sugavanam; and Shephard, Margaret C., to Imperial Chemical Industries PLC. 2-(2-Alkoxyalkyl)-1,2,4-triazole compounds and their use as fungicides. 4,394,380, Cl. 424-269.000.
Balco, Inc.: *See—*
Balzer, Claude P., 4,394,718, Cl. 362-278.000.
Ball, Martin F.; and Fidler, Fred, to Metal Box Limited. Closures for containers. 4,393,979, Cl. 220-270.000.
Balzer, Claude P., to Balco, Inc. Mounting brackets for handrail system. 4,394,718, Cl. 362-278.000.
Balzer & Droll KG: *See—*
Muskulus, Willi, 4,393,904, Cl. 140-92.100.
Bammert, Karl, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Lubrication and packing of a rotor-type compressor. 4,394,113, Cl. 418-98.000.
Banks, Donald S., to Raytheon Company. Modulation systems. 4,394,628, Cl. 332-19.000.
Barberio, Giancinto G., to Colgate-Palmolive Company. Dentrifrice preparation. 4,394,371, Cl. 424-52.000.
Barbour, William P., to Security Imprinter Corporation. Variable data imprinter with rack centering and carriage interlock mechanism. 4,393,768, Cl. 101-45.000.
Bare, Rex O.; and Robinson, Earl F., to C. R. Bard, Inc. Method of manufacture of electrode construction. 4,393,584, Cl. 29-877.000.
Barkhult, Bengt A., to Emab Electrolux Motor Aktiebolag. Construction for a motor-driven chain saw. 4,393,589, Cl. 30-381.000.
Barmatz, Martin B., to United States of America, National Aeronautics and Space Administration. System for controlled acoustic rotation of objects. 4,393,706, Cl. 73-505.000.
Barmatz, Martin B.; Trinh, Eugene H.; Wang, Taylor G.; Elleman, Daniel D.; and Jacobi, Nathan, to United States of America, National Aeronautics and Space Administration. Acoustic system for material transport. 4,393,708, Cl. 73-505.000.
Barnes, David I.: *See—*
Robinson, Joseph G.; and Barnes, David I., 4,394,499, Cl. 528-229.000.
Barnes, Michael W., to Thiokol Corporation. 2-Hydroxymethyl-1,3-propanediol nitrate ester. 4,394,329, Cl. 260-467.000.
Barneveld Binkhuysen, James P.: *See—*
van Drimmelen, Nicolaas J.; Barneveld Binkhuysen, James P.; van Renssen, Johan; and Verboom, Pieter, 4,394,265, Cl. 210-242.300.
Barnhard, Philip, IV; and Bahr, Lyman G., to Agnus Chemical Company. Explosive emulsion composition. 4,394,199, Cl. 149-21.000.
Baron, Howard C. Anatomical compression device. 4,393,867, Cl. 128-87.00R.
Bartenfield, James E.: *See—*
Brown, Lamar W.; and Bartenfield, James E., 4,394,289, Cl. 252-359.00E.
Barter, James A.; and Kellar, David E., to PPG Industries, Inc. Production of peroxydicarbonates. 4,394,328, Cl. 260-463.000.
Bartko, Richard. Grain loss sampling device. 4,393,704, Cl. 73-432.00R.
Bartkovitz, David J.; and Greene, George H., to Union Carbide Corporation. Crosslinkable poly(oxyalkylene) graft copolymers. 4,394,493, Cl. 525-530.000.
Bartolo, Jose B.: *See—*
Peuser, Michael F.; and Bartolo, Jose B., 4,394,356, Cl. 423-43.000.
Barton, Roy C.; and Smith, Dale A. Easily mountable swingable-arm draw-pin retainer. 4,394,031, Cl. 280-515.000.
BASF Aktiengesellschaft: *See—*
Eicken, Karl; Rohr, Wolfgang; and Wuerzer, Bruno, 4,394,513, Cl. 548-374.000.
Schnabel, Rolf; Weitz, Hans-Martin; and Fischer, Rolf, 4,394,290, Cl. 252-412.000.
BASF Wyandotte Corporation: *See—*
Walton, William B., 4,393,935, Cl. 166-263.000.
Bashilov, Vladimir A.: *See—*
Aronov, Sergei A.; Bashilov, Vladimir A.; Volkov, Nikolai M.; and Dukhovlinov, Sergei D., 4,394,591, Cl. 310-11.000.
Bassi, Aldo: *See—*
De Angelis, Giancarlo; Catastini, Alberto; Bassi, Aldo; Rogora, Edoardo; Radaelli, Dario; Bertoloni, Luciano; and Perrone, Francesco, 4,393,836, Cl. 123-417.000.
Batchelder, Clarence F.; Thomas, Charles E.; and Cassady, Kent B., to Clipp Control Corporation. Servo amplification system. 4,394,102, Cl. 414-5.000.
Bates Ventilsaekke Co. A/S: *See—*
Berthelsen, Ernst R.; and Hejlesen, Christian, 4,394,207, Cl. 156-578.000.
Battelle Memorial Institute: *See—*
Raman, Ramaswamy V.; and Carbonara, Robert S., 4,394,332, Cl. 264-8.000.
Batz, Hans-Georg, to Boehringer Mannheim GmbH. 1-(Substituted phenyl) aminoantipyrin compounds. 4,394,512, Cl. 548-365.000.
Bauer Kassenfabrik AG: *See—*
Spahni, Kurt; and Bucher, Walter, 4,394,584, Cl. 307-117.000.
Baum, Joerg P., to Baumco Gesellshaft fur Anlagentechnick mbH. Coke quench car emission control system. 4,394,218, Cl. 202-263.000.
Bauman, Ronald M., to United States of America, Navy. Channelized feed-forward system. 4,394,624, Cl. 330-151.000.
Baumco Gesellshaft fur Anlagentechnick mbH: *See—*
Baum, Joerg P., 4,394,218, Cl. 202-263.000.
Baumgaertner, Eugene R.: *See—*
Chung, Daniel C.; Miller, William A.; and Baumgaertner, Eugene R., 4,394,460, Cl. 521-92.000.
Bawarshi, Rima: *See—*
Hussain, Anwar A.; Hirai, Shinichiro; and Bawarshi, Rima, 4,394,390, Cl. 424-330.000.
Baxter Travenol Laboratories, Inc.: *See—*
Pearson, Stephen, 4,393,909, Cl. 150-8.000.
Bayer Aktiengesellschaft: *See—*
Kitzelmann, Dieter; and Deprez, Jacques, 4,394,239, Cl. 204-414.000.
Podszun, Wolfgang; Walkowiak, Michael; and Schulz, Hans-Hermann, 4,394,465, Cl. 523-116.000.
Scholl, Hans-Joachim, 4,394,495, Cl. 528-67.000.
Stolzer, Claus, 4,394,309, Cl. 260-140.000.
BBC Brown, Boveri & Company, Limited: *See—*
Jaecklin, Andre, 4,394,677, Cl. 357-38.000.
Beach, David L.; and Harrison, James J., to Gulf Research & Development Company. Group VA ylides and process for preparing same. 4,394,322, Cl. 260-440.000.
Beard, Buddy M.; and Beard, Joe M. Apparatus for the utilization of solar energy. 4,393,861, Cl. 126-436.000.
Beard, Joe M.: *See—*
Beard, Buddy M.; and Beard, Joe M., 4,393,861, Cl. 126-436.000.
Beasley, Max M., to Tuftco Corporation. Tufting machine with adjustable yarn guide tube bank. 4,393,793, Cl. 112-79.00R.
Beck, Warren R., to Minnesota Mining and Manufacturing Company. Low-permeability hollow spheres and pipe filled with the spheres for temporary weight reduction. 4,393,901, Cl. 138-145.000.
Beckman Instruments, Inc.: *See—*
Kaye, Wilbur I., 4,394,069, Cl. 350-347.00E.
Bedell, John R., to Electric Power Research Institute, Inc. Molten metal flow control. 4,394,006, Cl. 266-239.000.
Beecham Group Limited: *See—*
Bentley, Peter H.; Hardy, Kenneth D.; and Milner, Peter H., 4,394,375, Cl. 424-114.000.
Bell, Allyn R.: *See—*
Plant, Howard L.; Cantor, Steven E.; Doweyko, Arthur M.; Dekeyser, Mark A.; and Bell, Allyn R., 4,394,155, Cl. 71-94.000.
Bell Telephone Laboratories, Inc.: *See—*
Apgar, Waldo D.; Davis, Charles L.; Emery, Loring D., Jr.; Esseluhn, Werner F.; and Holbrook, Walter R., 4,394,602, Cl. 315-71.000.
Canniff, Ronald J., 4,394,756, Cl. 370-56.000.
Consoli, John J., 4,394,707, Cl. 361-398.000.
Donnelly, Vincent M.; Flamm, Daniel L.; and Karlicek, Robert F., Jr., 4,394,237, Cl. 204-192.00E.
Doyle, Francis S.; Prince, Terry B.; and Stevenson, Martin J., 4,394,545, Cl. 179-179.000.
Jackson, Kenneth A.; and Kimerling, Lionel C., 4,394,183, Cl. 148-1.500.
Mercer, Paul A., 4,394,743, Cl. 364-514.000.
Montalto, Anthony R.; Scerbo, Louis J.; and Starace, Jeremia P., 4,394,620, Cl. 324-149.000.
Van Dine, Gilbert A., 4,394,647, Cl. 340-645.000.
Bendix Corporation, The: *See—*
Frear, David L., 4,394,058, Cl. 339-59.00R.
Oltmanns, Roger W., Jr.; and Portolese, Larry A., 4,393,963, Cl. 188-73.450.
Seitz, William R., 4,393,845, Cl. 123-478.000.
Benford, John F.: *See—*
Bingham, Joseph P.; and Benford, John F., 4,394,535, Cl. 179-1.0GP.
Benny, John R.; Buher, Robert W.; and Smith, Paul K., to TEMCO, Inc. Vacuum pneumatic conveying apparatus and method for transferring food products. 4,394,259, Cl. 209-250.000.
Benschop, Gerardus C. M.: *See—*
Spruijt, Aloysius M. J. M.; Wijburg, Matheus A. T.; Benschop, Gerardus C. M.; and Vos, Hendrikus J. M., 4,394,067, Cl. 350-334.000.

Bentley, Peter H.; Hardy, Kenneth D.; and Milner, Peter H., to Beecham Group Limited. Cephalosporin derivatives, and compositions containing them. 4,394,375, Cl. 424-114.000.

Berg, Alf A.: *See*—
Favot, Guido; and Berg, Alf A., 4,393,678, Cl. 72-131.000.

Bergendahl, Albert S.; Hakey, Mark C.; and Wilson, John P., to International Business Machines Corporation. Process for increasing resolution of photolithographic images. 4,394,437, Cl. 430-312.000.

Bergman, Carl A.; Thomas, Roy L.; and Bourbeau, Richard A., to Standard Duplicating Machines Corporation. Sheet feeder with buckle restraint and feed roll slippage. 4,394,009, Cl. 271-10.000.

Bergmann, Horst; and Pracht, Hans, to Daimler-Benz Aktiengesellschaft. Conirol system for internal combustion engine. 4,393,831, Cl. 123-323.000.

Bergmann, Horst, to Daimler-Benz Aktiengesellschaft. Spark plug for internal combustion engines. 4,394,598, Cl. 313-51.000.

Berkowitz, Sidney; and Mohr, Richard A., to FMC Corporation. Method of purifying phosphoric acid. 4,394,361, Cl. 423-321.00S.

Bernard, Alain M., to Office National d'Etudes et de Recherches Aerospatiales. Electrostatic accelerometer. 4,393,710, Cl. 73-517.00B.

Bernstein, David H.; Carberry, Richard A.; Druke, Michael B.; and Gusowski, Ronald I., to Data General Corporation. Data processing system utilizing a unique two-level microcoding technique for forming microinstructions. 4,394,736, Cl. 364-200.000.

Bersier, Jacques: *See*—
Jager, Horst; Plattner, Eric; Bersier, Jacques; and Comninellis, Christos, 4,394,227, Cl. 204-73.00R.

Bertelsman, Dale M.; Eckert, William M.; and Morrow, Stanley J., to Dow Chemical Company, The. Spinel slip casting composition and articles. 4,394,455, Cl. 501-117.000.

Berthelsen, Ernst R.; and Hejlesen, Christian, to Bates Ventilsaekke Co. A/S. Apparatus for sealing the valve in a valve bag. 4,394,207, Cl. 156-578.000.

Bertoloni, Luciano: *See*—
De Angelis, Giancarlo; Catastini, Alberto; Bassi, Aldo; Rogora, Edoardo; Radaelli, Dario; Bertoloni, Luciano; and Perrone, Francesco, 4,393,836, Cl. 123-417.000.

Bertus, Brent J.: *See*—
Mark, Harold W.; Bertus, Brent J.; and Roberts, John S., 4,394,324, Cl. 260-446.000.

Betensky, Ellis I., to Vivitar Corporation. Zoom lens. 4,394,072, Cl. 350-427.000.

Bezjian, Krikor A.: *See*—
Frankston, Michael; and Bezjian, Krikor A., 4,394,651, Cl. 340-756.000.

Bickel, Hansjorg: *See*—
Bloch, Peter; and Bickel, Hansjorg, 4,393,625, Cl. 51-165.870.

Bickle, Wolfgang; Funke, Rolf; and Pfoh, Rolf, to Karl Schmidt GMBH. Composite material for sliding surface bearings. 4,394,275, Cl. 252-12.000.

Bienvenu, Jacques; Dufond, Patrick; Carre, Claude; Tuong, Duc L.; Verdier, Henri; deRivet, Philippe-Hubert; Bradley, John J.; and Franklin, Benjamin S., to Compagnie Honeywell Bull. Apparatus and method for transferring information units between processes in a multiprocessing system. 4,394,725, Cl. 364-200.000.

Binegar, Scott W.; and Saka, Hamid J., to ACF Industries, Incorporated. Fire-safe valve structure. 4,393,889, Cl. 137-72.000.

Bingham, Joseph P.; and Benford, John F., to RCA Corporation. Split phase stereophonic sound synthesizer. 4,394,535, Cl. 179-1.0GP.

BioMagnetech Corp.: *See*—
Blakemore, Richard P.; and Wolfe, Ralph S., 4,394,451, Cl. 435-253.000.

Biox Technology, Inc.: *See*—
Wilber, Scott A., 4,394,572, Cl. 250-239.000.

Bixler, Kenneth D.; Lord, Henry A.; and Reifers, Richard F., to Diamond International Corporation. Construction of universal egg cell cushion and method. 4,394,214, Cl. 162-228.000.

Blachman, Lawrence P., to Polymer Corporation, The. Anti-static hose assemblies. 4,394,705, Cl. 361-215.000.

Blakemore, Richard P.; and Wolfe, Ralph S., to BioMagnetech Corp. Culture medium and conditions for growth of magnetic bacteria. 4,394,451, Cl. 435-253.000.

Blanchard, Andrew J.: *See*—
Correa, Aderbal C.; Gergely, John S.; and Blanchard, Andrew J., 4,394,573, Cl. 250-253.000.

Blazso, Eva, to LGZ Landis & Gyr Zug AG. Method for the manufacture of a layer from a thermochrome lacquer, and its use. 4,394,407, Cl. 427-150.000.

Blenner, Donald R., to Lord Corporation. Method for vulcanization bonding of fluorine-containing elastomers to vulcanized natural and synthetic elastomers. 4,394,205, Cl. 156-307.300.

Bloch, Peter; and Bickel, Hansjorg, to Maag Gear-Wheel & Machine Company Limited. Apparatus for grinding gears. 4,393,625, Cl. 51-165.870.

Blohm & Voss AG: *See*—
Bohnenkamp, Wulf; and Hempel, Gerd, 4,393,658, Cl. 60-657.000.

Board, Robert D., to Ecolaire Incorporated. Direct contact condenser and separating method. 4,394,139, Cl. 55-20.000.

Bocchini, William R.: *See*—
Briner, Clifton F.; Bocchini, William R.; and Wilcockson, Brian, 4,393,524, Cl. 4-317.000.

Bock, Paul A. Thermodynamic method for steam-water separation. 4,393,816, Cl. 122-412.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Prins reaction products of diisoamylene, derivatives thereof, organoleptic uses thereof and processes for preparing same. 4,394,285, Cl. 252-174.110.

Bodenseewerk Perkin-Elmer & Co. GmbH: *See*—
Tamm, Rolf; and Tomoff, Toma, 4,393,726, Cl. 73-864.840.

Bodine, Albert G. Acoustic detonation suppression in a catalytic environment in internal combustion engine. 4,393,830, Cl. 123-272.000.

Bodine, Albert G. Method and apparatus for uniformly packing gravel around a well casing or liner. 4,393,932, Cl. 166-249.000.

Bodmin, Syd E., to Moore, Mae Lois. Weighted teat cup shell and assembly. 4,393,811, Cl. 119-14.470.

Boehringer Mannheim GmbH: *See*—
Batz, Hans-Georg, 4,394,512, Cl. 548-365.000.
Muller, Werner; and Bunemann, Hans, 4,394,487, Cl. 525-281.000.

Boeing Company, The: *See*—
Anderson, Charles N.; Elrod, Samuel D.; and Miller, Gerald O., 4,393,987, Cl. 228-157.000.

Boer, Hubert, to diga-die gasheizung GmbH. Pipeline pig for lining pipe lines. 4,393,805, Cl. 118-105.000.

Bohnenkamp, Wulf; and Hempel, Gerd, to Blohm & Voss AG. Extraction condensing turbine. 4,393,658, Cl. 60-657.000.

Bohner, Beat: *See*—
Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Burdeska, Kurt, 4,394,327, Cl. 260-455.00R.

Bombardier-Rotax Gesellschaft mbH.: *See*—
Schreiner, Joachim, 4,393,952, Cl. 180-6.440.

Bompard, Bruno; and Bruyere, Alain, to Commissariat a l'Energie Atomique; and Societe Brochier et Fils. Process for manufacture of three-dimensional rotational parts and machine for the implementation of such process. 4,394,203, Cl. 156-175.000.

Boon, Bart, to RSV-Gusto Engineering B.V. Device for coupling parts of a self-raising platform structure. 4,393,961, Cl. 188-67.000.

Boon, Raymond: *See*—
Galkin, Benjamin M.; Boon, Raymond; Gilliam, Rudolph V.; and Park, Chan H., 4,393,864, Cl. 128-1.100.

Boothe, Guy, to Sperry Corporation. Power failure detection and control circuit. 4,394,702, Cl. 361-92.000.

Boots Company PLC, The: *See*—
Copping, Leonard G.; Kerry, John C.; Watkins, Thomas I.; Willis, Robert J.; and Palmer, Bryan H., 4,394,387, Cl. 424-300.000.

Borchardt, John K.: *See*—
Smith, Charles W.; and Borchardt, John K., 4,393,939, Cl. 166-293.000.

Borras, Jaime A.; Gonzalez, Ruben J.; Smith, Daniel M.; and Wieczorek, Alfred B., to Motorola, Inc. Priority channel system for a synthesized transceiver. 4,394,776, Cl. 455-76.000.

Bosnia, Omar J., to Taybos Sociedad Anonima. Racket structure. 4,394,015, Cl. 273-73.00C.

Boudon, Gerard; Denis, Bernard; de Grivel, Virginie; and Mollier, Pierre, to International Business Machines Corporation. Decoding and selection circuit for a monolithic memory. 4,394,752, Cl. 365-227.000.

Boulianne, Roland. Snowmobile. 4,393,953, Cl. 180-190.000.

Bourbeau, Richard A.: *See*—
Bergman, Carl A.; Thomas, Roy L.; and Bourbeau, Richard A., 4,394,009, Cl. 271-10.000.

Bouvet, Claude: *See*—
Terrien, Michel E.; and Bouvet, Claude, 4,393,533, Cl. 14-2.600.

Boyarsky, Abraham; Friedman, Jack; Christodoulopoulos, Athanasios; and Lee, Rock, to Canadian Patents & Development Limited. Electronically controlled respirator. 4,393,869, Cl. 128-204.180.

Braden, Denver, to Palomar Systems & Machines, Inc. Means for processing miniature electronic components. 4,393,808, Cl. 118-503.000.

Bradley, John J.: *See*—
Bienvenu, Jacques; Dufond, Patrick; Carre, Claude; Tuong, Duc L.; Verdier, Henri; deRivet, Philippe-Hubert; Bradley, John J.; and Franklin, Benjamin S., 4,394,725, Cl. 364-200.000.

Brand, Glen. Fluid flow meter. 4,393,723, Cl. 73-861.720.

Brandenburger, Allen M.: *See*—
Maclin, Greg P.; and Brandenburger, Allen M., 4,393,989, Cl. 229-71.000.

Brandt, John G.; Dickerson, Joyce H.; and Schmitt, William R., to RJ Archer Inc. Heat-sealable polypropylene blends and methods for their preparation. 4,394,235, Cl. 204-165.000.

Brautigam, Reinhard: *See*—
von Alpen, Ulrich; Brautigam, Reinhard; and Oliapuram, Antony, 4,394,280, Cl. 252-62.200.

Brecy, Andre; and Grudler, Francois, to Cii Honeywell Bull. Control apparatus for an electro-mechanical device that generates a back EMF. 4,394,604, Cl. 318-257.000.

Brede, Uwe; and Penner, Horst, to Dynamit Nobel Aktiengesellschaft. Electric detonator element. 4,393,779, Cl. 102-202.500.

Breeck, Philip L.; Shultz, David E.; and Rosselli, Andrew C., to Cummins Engine Company, Inc. System for controlling fuel flow within an internal combustion engine. 4,393,825, Cl. 123-198.00F.

Breeze, Eric G., to General Instrument Corporation. Bi-directional driye multiplexed display system. 4,394,653, Cl. 340-802.000.

Brennen, Michael B.; Gyugyi, Laszlo; and Stacey, Eric J., to Westinghouse Electric Corp. Static VAR generators. 4,394,614, Cl. 323-210.000.

Brennsteiner, Ernst: *See*—
Lutze, Uwe; Scholz, Dieter; and Brennsteiner, Ernst, 4,393,947, Cl. 175-323.000.

Brent, Albert: *See*—
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,394,137, Cl. 48-197.00R.

Brescia, Riccardo, to Ing. C. Olivetti & C., S.p.A. Electronic printer. 4,394,668, Cl. 346-139.00R.

Bresser, Robert E.; White, Sidney S., Jr.; and Koeniger, Arthur F., to Carstab Corporation. Elemental sulfur-stablized organic antimony compound composition. 4,394,325, Cl. 260-446.000.

Briner, Clifton F.; Bocchini, William R.; and Wilcockson, Brian, to American Standard, Inc. Self-contained sewage waste disposal system. 4,393,524, Cl. 4-317.000.

Brink, Andries: *See*—
Jager, Berend; Brink, Andries; and Kleynjan, Cornelis, 4,394,215, Cl. 196-14.520.

Bristol-Myers Company: *See*—
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,394,508, Cl. 546-209.000.
Kamachi, Hajime; Okumura, Jun; Naito, Takayuki; and Oka, Masahisa, 4,394,503, Cl. 544-25.000.

British Aerospace Public Limited Company: *See*—
Mahoon, Alauddin; and Kohler, Richard P. J., 4,394,224, Cl. 204-57.000.

Brittain, John E.: *See*—
Cattell, Graham S.; and Brittain, John E., 4,393,755, Cl. 99-348.000.

Britz, Elizabeth. Invalid chair. 4,393,529, Cl. 5-81.00R.

Broadt, David R.: *See*—
Brower, Boyd G.; Broadt, David R.; and Shaffer, John W., 4,394,710, Cl. 361-401.000.

Brock, David A.; and Gupta, Surendra K., to Miles Laboratories, Inc. Method for purification of uricase. 4,394,450, Cl. 435-191.000.

Brock, Josef, to Maschinenfabrik Carl Zangs Aktiengesellschaft. Transmission for the shed-forming mechanism of a loom. 4,393,902, Cl. 139-76.000.

Brockwell, Malcolm G., to Ciba-Geigy AG. Illumination system for copying apparatus. 4,394,717, Cl. 362-247.000.

Brooklyn Union Gas Company: *See*—
Thomas, William R.; and Sykora, George S., 4,394,202, Cl. 156-94.000.

Brooks, Ralf M.: *See*—
Osmera, Miroslav S.; and Brooks, Ralf M., 4,394,092, Cl. 400-120.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Asano, Kiyomitsu; Jozuka, Masao; and Kondo, Toshikatsu, 4,394,093, Cl. 400-124.000.

Brower, Boyd G.; and Shaffer, John W., to GTE Products Corporation. Die-stamped circuit board assembly having relief means to prevent total switch deformation. 4,394,709, Cl. 361-401.000.

Brower, Boyd G.; Broadt, David R.; and Shaffer, John W., to GTE Products Corporation. Die-stamped circuit board assembly for photoflash devices. 4,394,710, Cl. 361-401.000.

Brown, Boniard I.: *See*—
Fernandez, Carlos, 4,393,948, Cl. 175-374.000.

Brown, Boveri & Cie AG: *See*—
Rohr, Franz-Josef, 4,394,222, Cl. 204-1.00T.

Brown, Daniel G.; and Motsinger, Donald L., to PPG Industries, Inc. Aqueous sizing composition for glass fibers for use on chopped glass fibers. 4,394,414, Cl. 428-288.000.

Brown, Garrett; and Di Giulio, Arnold O. Support apparatus. 4,394,075, Cl. 352-243.000.

Brown, Harvey A.; and Huffman, William A., to Minnesota Mining and Manufacturing Company. Helichromic compounds and displays. 4,394,070, Cl. 350-349.000.

Brown, Lamar W.; and Bartenfield, James E. Continuous foam generating system. 4,394,289, Cl. 252-359.00E.

Brown & Williamson Tobacco Corporation: *See*—
Silberstein, Donald A., 4,393,885, Cl. 131-339.000.

Browne, Edward M.; and Smither, Miles A., to Geosource Inc. Cable break locator. 4,394,616, Cl. 324-52.000.

Bruinsma, John, to U.S. Philips Corporation. Frequency division communication system wherein conventional transmitter-transceiver can be used as a repeater or local base station. 4,394,775, Cl. 455-17.000.

Brunelle, Rene J., to UOP Inc. Seat back mounting system. 4,394,047, Cl. 297-361.000.

Bruyere, Alain: *See*—
Bompard, Bruno; and Bruyere, Alain, 4,394,203, Cl. 156-175.000.

Bucher, Franz. Reinforcing element and process for its manufacture. 4,393,639, Cl. 52-730.000.

Bucher, Walter: *See*—
Spahni, Kurt; and Bucher, Walter, 4,394,584, Cl. 307-117.000.

Buck, Wolfgang; Sehring, Richard; Linden, Gerbert; and Lust, Sigmund, to Celamerck GmbH & Co. KG. 2-Chloro-3-(phenoxy or phenylthio)-6-6-nitro -anilines. 4,394,159, Cl. 71-98.000.

Budelman, Gerald A., to CBS, Inc. Electronic organ circuit. 4,393,741, Cl. 84-1.010.

Bueno, Alejandro G.; and Stover, K. Lawrence, to Libbey-Owens-Ford Company. Furnace regenerator with improved flow distribution. 4,394,122, Cl. 432-30.000.

Buher, Robert W.: *See*—
Benny, John R.; Buher, Robert W.; and Smith, Paul K., 4,394,259, Cl. 209-250.000.

Bukowski, Ronald G.; and Johnson, Timothy L., to Zurn Industries, Inc. System for minimizing backwash water usage on self-cleaning strainers. 4,394,262, Cl. 210-103.000.

Bullis, Robert H.: *See*—
Wiegand, Walter J.; and Bullis, Robert H., 4,393,719, Cl. 73-861.050.

Bulten-Kanthal Aktiebolag: *See*—
Magnusson, Klas B. O., 4,394,566, Cl. 219-523.000.

Bunemann, Hans: *See*—
Muller, Werner; and Bunemann, Hans, 4,394,487, Cl. 525-281.000.

Burdeska, Kurt: *See*—
Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Burdeska, Kurt, 4,394,327, Cl. 260-455.00R.

Burger, Rainer, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Rotary printing machine, particularly newspaper-type offset printing machine. 4,393,772, Cl. 101-217.000.

Burke, Mary. Spoon lid. 4,393,988, Cl. 229-43.000.

Burlington Industries, Inc.: *See*—
Wang, Kenneth Y.; and Hill, Berlie R., 4,394,208, Cl. 156-580.100.

Burquier, Jean-Luc, to S.A. Des Etablissements Staubli. Multiple unions for simultaneously joining a plurality of pneumatic or hydraulic pipes. 4,394,039, Cl. 285-85.000.

Burroughs Wellcome Co.: *See*—
Mason, Donald L.; and McAllister, Warren A., 4,393,717, Cl. 73-821.000.

Burstein, Steve; and Popper, Jay, to Standard Microsystems Corporation. Low power storage cell. 4,394,751, Cl. 365-227.000.

Butcher, James S., to GTE Automatic Electric Labs Inc. Load protecting arrangement. 4,394,703, Cl. 361-101.000.

Butler, L. Dennis; and Askov, Alan R., to Sperry Corporation. Hydraulic system for a round bale wagon. 4,394,103, Cl. 414-24.500.

Byrd, Carlisle O., Jr., to J T Thorpe Company. Method of installing defractory ceramic fiber module. 4,393,569, Cl. 29-460.000.

Byrne, LeRoy H.: *See*—
Mol, Hans C.; and Byrne, LeRoy H., 4,393,894, Cl. 137-454.000.

C. C. Kelley & Sons: *See*—
Kelley, Clarence R., 4,393,751, Cl. 91-408.000.

C-Cor Electronics, Inc.: *See*—
Pavlic, John C., 4,394,631, Cl. 333-132.000.

C. Levesque Co. Inc.: *See*—
Levesque, Clarence N., 4,393,632, Cl. 52-235.000.

C. R. Bard, Inc.: *See*—
Bare, Rex O.; and Robinson, Earl F., 4,393,584, Cl. 29-877.000.

Cabot Berylco, Inc.: *See*—
McClelland, Henry T.; and Kuhn, Joseph B., 4,394,185, Cl. 148-11.50C.

Cadars, Patrick; and Hellouin de Cenival, Bruno, to VALEO. Expansion tank and water box device for heat exchanger, such as a radiator of a motor vehicle. 4,394,141, Cl. 55-195.000.

Caddy, John A.; and Putman, William A., to Allis-Chalmers Corporation. Internally supported filter. 4,394,147, Cl. 55-357.000.

Cadmus, Martin C.; and Knutson, Clarence A., Jr., to United States of America, Agriculture. Production of high-pyruvate xanthan gum on synthetic medium. 4,394,447, Cl. 435-104.000.

Cady, William R.; Yu, SePuan; and Eshbach, John R., to General Electric Company. Method of making silicon-on-sapphire FET. 4,393,578, Cl. 29-576.00B.

Cahuzac, Georges J. J., to Societe Nationale Industrielle Aerospatiale. Automatic lacing method and apparatus for making pieces with multidirectional woven reinforcement. 4,393,669, Cl. 66-13.000.

Calabrese, Diane M. Ankle garter with foot stirrup. 4,393,522, Cl. 2-336.000.

Calas, Patrick: *See*—
Commeyras, Auguste; and Calas, Patrick, 4,394,225, Cl. 204-59.00R.

Calgon Carbon Corporation: *See*—
Joyce, Ronald S., 4,394,354, Cl. 423-25.000.

California Institute of Technology: *See*—
Cole, Steven W., 4,394,613, Cl. 320-48.000.

Callihan, Rudy B.: *See*—
Muse, John F.; Callihan, Rudy B.; Goad, Bobby F.; and Wainwright, Clyde S., Jr., 4,393,931, Cl. 166-208.000.

Camerini, Mario; and Pizzi, Giacomo. Container storage installation. 4,394,104, Cl. 414-276.000.

Cameron, Erma C.; Gunter, Claude R.; and White-Stevens, Rodric H., to Miles Laboratories, Inc. Cofactor indicator compositions. 4,394,444, Cl. 435-11.000.

Campagna, Frank: *See*—
Campagna, Thomas G.; D'Andrea, Alfred A., Sr.; and Campagna, Frank, 4,394,716, Cl. 362-158.000.

Campagna, Thomas G.; D'Andrea, Alfred A., Sr.; and Campagna, Frank, to Aqualume, Incorporated. Self-contained underwater light assembly. 4,394,716, Cl. 362-158.000.

Campbell, Bernard F.; and Vallance, Leslie. Retractable protective-screens and equipment including them. 4,393,788, Cl. 109-2.000.

Campbell, Jules D., Jr., to Motorola, Inc. ROM Column select circuit and sense amplifier. 4,394,748, Cl. 365-104.000.

Canadian Patents & Development Limited: *See*—
Boyarsky, Abraham; Friedman, Jack; Christodoulopoulos, Athanasios; and Lee, Rock, 4,393,869, Cl. 128-204.180.

Canadian Superior Oil Ltd.: *See*—
Garrison, Barney D., Jr.; and Marjanovich, Barry S., 4,394,150, Cl. 71-62.000.

Canniff, Ronald J., to Bell Telephone Laboratories, Incorporated. Generation of busy signals in a digital concentrator. 4,394,756, Cl. 370-56.000.

Canon Denshi Kabushiki Kaisha: *See*—
Takahashi, Hiroshi, 4,393,770, Cl. 101-93.220.

Canon Kabushiki Kaisha: *See*—
Hashimoto, Teiji; and Saito, Syuichiro, 4,394,081, Cl. 354-234.000.
Kimura, Hirovuki; and Yamada, Tateo, 4,394,080, Cl. 354-173.000.
Ozawa, Masakazu; Watanabe, Kunio; Matsumoto, Shigeyuki; Nishimura, Yukuo; and Miyazaki, Takashi, 4,394,669, Cl. 346-140.00R.
Saito, Takashi; Sakurayama, Junichi; and Watanabe, Tsuyoshi, 4,394,431, Cl. 430-119.000.
Senuma, Michio; and Watanabe, Kunio, 4,394,082, Cl. 354-246.000.
Shimizu, Isamu; Shirai, Shigeru; and Inoue, Eiichi, 4,394,425, Cl. 430-65.000.
Shimizu, Isamu; Shirai, Shigeru; and Inoue, Eiichi, 4,394,426, Cl. 430-65.000.
Sugitani, Hiroshi; Matsuda, Hiroto; Kimura, Koichi; and Ikeda, Masami, 4,394,670, Cl. 346-140.00R.
Takahashi, Hiroshi, 4,393,770, Cl. 101-93.220.
Verber, Carl M.; Kenan, Richard P.; and Ridgway, Richard, 4,394,060, Cl. 350-96.130.
Yamada, Yasuyuki, 4,394,071, Cl. 350-422.000.

Cantor, Steven E.: *See*—
Plant, Howard L.; Cantor, Steven E.; Doweyko, Arthur M.; Dekeyser, Mark A.; and Bell, Allyn R., 4,394,155, Cl. 71-94.000.

Cappel, Bert; Schniggenfittig, Gunther; and Schuhmann, Siegfried, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Arrangement for metering the ink quantity in inking units on printing presses. 4,393,775, Cl. 101-365.000.

Cappel, Carl R., to Eastman Kodak Company. Yellow-dye-forming photographic developing composition. 4,394,440, Cl. 430-379.000.

Carberry, Richard A.: *See*—
Bernstein, David H.; Carberry, Richard A.; Druke, Michael B.; and Gusowski, Ronald I., 4,394,736, Cl. 364-200.000.

Carbonara, Robert S.: *See*—
Raman, Ramaswamy V.; and Carbonara, Robert S., 4,394,332, Cl. 264-8.000.

Carl Freudenberg, Firma: *See*—
Krull, Manfred; Lobert, Udo; Stamm, Dieter; and Veeser, Klaus, 4,394,411, Cl. 428-70.000.

Carlo Erba Strumentazione S.p.A.: *See*—
Dosch, Werner; and Wagner, Heinz, 4,394,263, Cl. 210-198.200.

Carnation Company: *See*—
Lometillo, Josephine E.; and Wolcott, John M., 4,394,397, Cl. 426-557.000.

Carpino, Louis A.; and Cohen, Beri, to Research Corporation. Amino acid blocking agents. 4,394,519, Cl. 560-32.000.

Carre, Claude: *See*—
Bienvenu, Jacques; Dufond, Patrick; Carre, Claude; Tuong, Duc L.; Verdier, Henri; deRivet, Philippe-Hubert; Bradley, John J.; and Franklin, Benjamin S., 4,394,725, Cl. 364-200.000.

Carrier Corporation: *See*—
Dennis, Richard D., 4,394,549, Cl. 200-16.00E.

Carroll, Raymond J., Jr.: *See*—
Lapeyre, James M.; Svendsen, Noel A.; Carroll, Raymond J., Jr.; Long, Henry H.; and Lindberg, Richard S., 4,393,544, Cl. 17-73.000.

Carstab Corporation: *See*—
Bresser, Robert E.; White, Sidney S., Jr.; and Koeniger, Arthur F., 4,394,325, Cl. 260-446.000.

Cartmell, Robert R., to Standard Oil Company (Indiana). Apparatus for the fluidized catalytic cracking of hydrocarbon feedstock. 4,394,349, Cl. 422-147.000.

Casady, Kent B.: *See*—
Batchelder, Clarence F.; Thomas, Charles E.; and Casady, Kent B., 4,394,102, Cl. 414-5.000.

Casperson, John R., to Phillips Petroleum Company. Dryer thermal efficiency. 4,393,603, Cl. 34-39.000.

Catastini, Alberto: *See*—
De Angelis, Giancarlo; Catastini, Alberto; Bassi, Aldo; Rogora, Edoardo; Radaelli, Dario; Bertoloni, Luciano; and Perrone, Francesco, 4,393,836, Cl. 123-417.000.

Caterpillar Tractor Co.: *See*—
Grawey, Charles E.; and Groezinger, John J., 4,393,913, Cl. 152-364.000.
Hoffman, John P., 4,394,723, Cl. 363-87.000.

Cattell, Graham S.; and Brittain, John E., to A.P.V. Company Limited, The. Heat treatment of particulate solid materials. 4,393,755, Cl. 99-348.000.

Cavanagh, Eric J.: *See*—
Mowbray, Dorian F.; Fenne, Ivor; and Cavanagh, Eric J., 4,393,846, Cl. 123-502.000.

CBS, Inc.: *See*—
Budelman, Gerald A., 4,393,741, Cl. 84-1.010.

Celamerck GmbH & Co. KG: *See*—
Buck, Wolfgang; Sehring, Richard; Linden, Gerbert; and Lust, Sigmund, 4,394,159, Cl. 71-98.000.

Celanese Corporation: *See*—
Edelman, Robert, 4,394,467, Cl. 523-205.000.
Fruge', James D., 4,394,355, Cl. 423-27.000.
Kastelic, John R., 4,394,498, Cl. 528-193.000.
Lu, Shau-Zou, 4,394,468, Cl. 523-205.000.

Central Mine Equipment Company: *See*—
Rassieur, Charles L., 4,393,945, Cl. 173-163.000.

Centronics Data Computer Corporation: *See*—
Yeomans, David; Wilkinson, Christopher J.; McCartney, Damien; and O'Dwyer, Micheal, 4,394,685, Cl. 358-264.000.

Chai, Stephen T.: *See*—
Cheng, David; and Chai, Stephen T., 4,394,667, Cl. 346-137.000.

Chaintreau, Bernard: *See*—
Pottier, Alain; Chesnel, Pierre; and Chaintreau, Bernard, 4,393,946, Cl. 175-4.560.

Chandler Evans Inc.: *See*—
Peck, Robert E.; and Zagranski, Raymond D., 4,393,651, Cl. 60-39.281.

Chao, Chien C.; and Sherman, John D., to Union Carbide Corporation. Bulk lactulose/lactose separation by selective adsorption on zeolitic molecular sieves. 4,394,178, Cl. 127-46.300.

Chao, Yen-Yau H., to Rohm and Haas Company. Copper modified mancozeb. 4,394,316, Cl. 260-429.00K.

Charniga, Joseph. Wall construction. 4,393,633, Cl. 52-303.000.

Charnoske, Nicky L. Animal trap signal apparatus. 4,393,617, Cl. 43-96.000.

Charrier, Pierre. Apparatus for moving film cassettes. 4,394,771, Cl. 378-172.000.

Chatlos, Richard, to Air-O-Scoop Corporation. Attachment for motor vehicles with rear windows. 4,393,753, Cl. 98-2.120.

Chattha, Mohinder S.; and Theodore, Ares N., to Ford Motor Company. High solids coatings with enhanced flexibility and impact strength. 4,394,486, Cl. 525-162.000.

Chemische Fabrik Kalk GmbH: *See*—
Jenkner, Herbert; Strang, Robert; and Adermann, Peter, 4,394,484, Cl. 525-72.000.

Chemplex Company: *See*—
Adur, Ashok M., 4,394,485, Cl. 525-74.000.

Chen, James M. F.: *See*—
Yang, James; and Chen, James M. F., 4,393,550, Cl. 24-117.000.

Chen, Wen-Hsiung: *See*—
Widergren, Robert D.; Chen, Wen-Hsiung; Fralick, Stanley C.; and Tescher, Andrew G., 4,394,774, Cl. 382-56.000.

Cheng, Dah Yu, to International Power Technology, Inc. Steam output control system. 4,393,649, Cl. 60-39.050.

Cheng, David; and Chai, Stephen T., to Xerox Corporation. Radial access drive for an optical disk recorder. 4,394,667, Cl. 346-137.000.

Cheng, Haw-Lin. Rotary shuttle for a sewing machine. 4,393,798, Cl. 112-231.000.

Cheng, Paul J., to Phillips Petroleum Company. Method and apparatus for vortex flow carbon black production. 4,394,350, Cl. 422-150.000.

Cherian, Gabriel B., to AMP Incorporated. Method of forming leads on a lead frame. 4,393,581, Cl. 29-827.000.

Cheriton, Leslie W.; and Ansell, Philip J. Self-levelling cementitious mixes. 4,394,175, Cl. 106-90.000.

Chesnel, Pierre: *See*—
Pottier, Alain; Chesnel, Pierre; and Chaintreau, Bernard, 4,393,946, Cl. 175-4.560.

Chevron Research Company: *See*—
deVries, Louis; and King, John M., 4,394,279, Cl. 252-46.400.
Ferm, Richard L., 4,394,213, Cl. 162-163.000.
Gibson, Kirk R., 4,394,303, Cl. 252-470.000.
Grossberg, Arnold L., 4,394,250, Cl. 208-108.000.
Miller, Stephen J., 4,394,251, Cl. 208-111.000.
Miller, Stephen J., 4,394,362, Cl. 423-328.000.
Small, Vernon R., Jr., 4,394,276, Cl. 252-32.70E.
Small, Vernon R., Jr., 4,394,277, Cl. 252-32.70E.
Van Nordstrand, Robert A., 4,394,253, Cl. 208-251.00H.

Chew, Meng-Sang: *See*—
Maki, Emil R.; Freudenstein, Ferdinand; Richard, Raymond L., Jr.; and Chew, Meng-Sang, 4,393,820, Cl. 123-90.410.

Chiang, David: *See*—
Manber, Solomon; Chiang, David; and Chu, Mosi, 4,394,076, Cl. 354-5.000.

Chikugo, Kazuo: *See*—
Furukawa, Hideo; Chikugo, Kazuo; and Otsuki, Yoichi, 4,393,823, Cl. 123-196.00M.

Child, Edward T.: *See*—
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,394,137, Cl. 48-197.00R.

Chimicasa GmbH: *See*—
Sampathkumar, Prathivadibhayankaram S.; and Dwivedi, Basant K., 4,394,308, Cl. 260-112.50R.

Chmiel, Max: *See*—
Rosener, Karlheinz; Roeder, Alfred; Munchberg, Wolfgang; Richrath, Herbert; and Chmiel, Max, 4,394,454, Cl. 501-112.000.

Chmura, William J.; and Slusarski, Ronald S., to Textron Inc. Thread forming of sintered porous metal shapes. 4,394,421, Cl. 428-547.000.

Christian Majer GmbH & Co. KG.: *See*—
Kolb, Dieter, 4,394,209, Cl. 156-580.100.

Christodoulopoulos, Athanasios: *See*—
Boyarsky, Abraham; Friedman, Jack; Christodoulopoulos, Athanasios; and Lee, Rock, 4,393,869, Cl. 128-204.180.

Chrysler Corporation: *See*—
Sperlich, Harold K., 4,394,100, Cl. 410-2.000.

Chu, Chin C.; and Kaeding, Warren W., to Mobil Oil Corporation. Zeolite catalyst modified with group IVB metal. 4,394,300, Cl. 252-455.00Z.

Chu, Mosi: *See*—
Manber, Solomon; Chiang, David; and Chu, Mosi, 4,394,076, Cl. 354-5.000.

Chu, Tsan-chen. Timepiece with automatic time setting system thru dial telephone line and automatic speed adjusting system. 4,394,539, Cl. 179-2.0TC.

Chung, Daniel C.; Miller, William A.; and Baumgaertner, Eugene R., to Allied Corporation. Ethylene-chlorotrifluoroethylene copolymer foam. 4,394,460, Cl. 521-92.000.

Ciba-Geigy AG: *See*—
Brockwell, Malcolm G., 4,394,717, Cl. 362-247.000.
Jager, Horst; Plattner, Eric; Bersier, Jacques; and Comninellis, Christos, 4,394,227, Cl. 204-73.00R.

Ciba-Geigy Corporation: *See*—
Andrews, Christopher M., 4,394,492, Cl. 525-504.000.
Holzle, Gerd; Reinert, Gerhard; and Polony, Rudolf, 4,394,125, Cl. 8-103.000.
Pissiotas, Georg; and Rempfler, Hermann, 4,394,157, Cl. 71-94.000.
Pissiotas, Georg; and Rempfler, Hermann, 4,394,158, Cl. 71-94.000.
Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Bardeska, Kurt, 4,394,327, Cl. 260-455.00R.
Strasilla, Dieter; Moldovanyi, Laszlo; Fearnley, Charles; and Meindl, Hubert, 4,393,886, Cl. 132-7.000.
Sturm, Elmar; Schempp, Heinrich; and Martin, Henry, 4,394,152, Cl. 71-77.000.
Tobler, Hans; Fory, Werner; and Schurter, Rolf, 4,394,156, Cl. 71-94.000.

Cii Honeywell Bull: *See*—
Brecy, Andre; and Grudler, Francois, 4,394,604, Cl. 318-257.000.

Cincinnati Milacron Inc.: *See*—
Schroer, George A., 4,393,626, Cl. 51-168.000.

Clark-Cutler-McDermott Company: *See*—
McDermott, Thomas R.; and Jackson, Robert K., 4,393,634, Cl. 52-309.100.

Clark, John F., to Adnovum AG. Clamp, tool, and electrolysis cell anode mount. 4,394,242, Cl. 204-243.00R.

Clark, John L., to Honeywell Inc. Current switching technique. 4,394,761, Cl. 371-8.000.

Clark, Lowell E.: *See*—
Winchell, Vern H., II; Scharr, Thomas A.; and Clark, Lowell E., 4,394,678, Cl. 357-68.000.

Clark, Ronald K.; and Lisagor, W. Barry, to United States of America, National Aeronautics and Space Administration. Fixture for environmental exposure of structural materials under compression load. 4,393,716, Cl. 73-818.000.

Clark, Susan. Padded frame. 4,393,612, Cl. 40-152.000.

Clark, Thomas R.; Lillmars, Alvin E.; Roth, Elwood A.; Schmick, Alvin L.; and Todd, Maurice C., to Du Pont de Nemours, E. I., and Company. Cutter for a moving strand. 4,393,736, Cl. 83-100.000.

Clark, Walter L.; and Sutton, Trevor G., to Garrett Corporation, The. Static pressure probe and method. 4,393,692, Cl. 73-115.000.

Clarke, Donald A.: *See*—
Liptay-Wagner, Nicholas; Renaud, Roland; Pryor, Timothy R.; and Clarke, Donald A., 4,394,683, Cl. 358-107.000.

Clausen, Victor H.; and Asbury, Charles E., to H. B. Fuller Company. Apparatus and method for applying an elongated tab to a moving substrate. 4,394,206, Cl. 156-322.000.

Clay, Howard W. Hammer with two detachable heads. 4,393,908, Cl. 145-29.00A.

Clipp Control Corporation: *See*—
Batchelder, Clarence F.; Thomas, Charles E.; and Casady, Kent B., 4,394,102, Cl. 414-5.000.

Clitherow, John W., to Glaxo Group Limited. Process for the preparation of a furan derivative. 4,394,516, Cl. 549-495.000.

Clough, John M.: *See*—
de Fraine, Paul; Clough, John M.; and Worthington, Paul A., 4,394,151, Cl. 71-76.000.

Coal Industry (Patents) Limited: *See*—
Robinson, Joseph G.; and Barnes, David I., 4,394,499, Cl. 528-229.000.

Coburn, Orin W.: *See*—
Maloy, Rex M., 4,393,972, Cl. 194-99.000.

Coca-Cola Company, The: *See*—
Winter, John P.; and Tomic, Mladomir, 4,394,473, Cl. 524-226.000.

Coe, Norman O. Structural beam square. 4,393,600, Cl. 33-474.000.

Cohen, Beri: *See*—
Carpino, Louis A.; and Cohen, Beri, 4,394,519, Cl. 560-32.000.

Cohen, Leonard D., to Eaton Corporation. Phased array feed system. 4,394,660, Cl. 343-100.0SA.

Cole, Denis B.; and Trethewy, Derek C., to Hazelwood Enterprises Limited. Method and apparatus for handling and filling bags or envelopes. 4,393,640, Cl. 53-69.000.

Cole, Steven W., to California Institute of Technology. Full-charge indicator for battery chargers. 4,394,613, Cl. 320-48.000.

Colgate-Palmolive Company: *See*—
Barberio, Giancinto G., 4,394,371, Cl. 424-52.000.

Collin, Per H., to Asea AB. Process for the manufacture of crude iron and synthesis gas. 4,394,163, Cl. 75-11.000.

Collonia, Harald: *See*—
Mann, Arnold; and Collonia, Harald, 4,393,833, Cl. 123-335.000.

Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, to GTE Automatic Electric Labs Inc. Allocation controller providing for access of multiple common resources by a duplex plurality of central processing units. 4,394,728, Cl. 364-200.000.

Commeyras, Auguste; and Calas, Patrick, to Produits Chimiques Ugine Kuhlmann. Process for the addition of iodoperfluoroalkanes onto ethylenic or acetylenic compounds by electrocatalysis. 4,394,225, Cl. 204-59.00R.

Commissariat a l'Energie Atomique: *See*—
Bompard, Bruno; and Bruyere, Alain, 4,394,203, Cl. 156-175.000.

Commons, Thomas J.; and Potoski, John R., to American Home Products Corporation. Cephalosporin derivatives. 4,394,504, Cl. 544-28.000.

Comninellis, Christos: *See*—
Jager, Horst; Plattner, Eric; Bersier, Jacques; and Comninellis, Christos, 4,394,227, Cl. 204-73.00R.

Compagnie Generale des Etablissements Michelin: *See*—
Gouttebessis, Jacques, 4,393,912, Cl. 152-353.00R.

Compagnie Honeywell Bull: *See*—
Bienvenu, Jacques; Dufosd, Patrick; Carre, Claude; Tuong, Duc L.; Verdier, Henri; deRivet, Philippe-Hubert; Bradley, John J.; and Franklin, Benjamin S., 4,394,725, Cl. 364-200.000.

Compression Labs, Inc.: *See*—
Widergren, Robert D.; Chen, Wen-Hsiung; Fralick, Stanley C.; and Tescher, Andrew G., 4,394,774, Cl. 382-56.000.

Comptech, Incorporated: *See*—
Slabaugh, Edward J., 4,393,896, Cl. 137-601.000.

Cone, Michael M., to Du Pont de Nemours, E. I., and Company. Triarylboraneisocy ano metal compounds. 4,394,321, Cl. 260-439.00R.

Conley, Larry R., to Interconnection Technology, Inc. Circuit board with weldable terminals. 4,394,711, Cl. 361-408.000.

Connors, Robert H.: *See*—
Klopfenstein, King L.; and Connors, Robert H., 4,393,950, Cl. 177-108.000.

Conoco Inc.: *See*—
Correa, Aderbal C.; Gergely, John S.; and Blanchard, Andrew J., 4,394,573, Cl. 250-253.000.
Peterson, Marvin L.; Hein, Norman W., Jr.; and Oertle, Donald H., 4,394,577, Cl. 250-372.000.
Waters, Kenneth H., 4,394,754, Cl. 367-75.000.

Consoli, John J., to Bell Telephone Laboratories, Incorporated. Electrical circuit package. 4,394,707, Cl. 361-398.000.

Conta, Renato, to Ing. C. Olivetti & C., S.p.A. Optical transducer. 4,393,591, Cl. 33-1.00L.

Container Corporation of America: *See*—
Maclin, Greg P.; and Brandenburger, Allen M., 4,393,989, Cl. 229-71.000.

Continental Group, Inc., The: *See*—
Walter, John; Roth, Donald J.; and Kubis, Charles S., 4,394,408, Cl. 427-231.000.

Controlled Environment Systems Inc.: *See*—
Widmayer, Don F., 4,394,603, Cl. 315-311.000.

Converse Inc.: *See*—
Crowley, Kevin J., 4,393,604, Cl. 36-67.00R.

Cook, Richard J.; and Reade, Richard, to Mid-Continent Aircraft Corporation. Front loader vehicle with telescoping boom. 4,394,108, Cl. 414-680.000.

Cooper, Harold W. Flotation life support device. 4,394,124, Cl. 441-86.000.

Cooper, Julius: *See*—
Orbanes, Philip; and Cooper, Julius, 4,394,018, Cl. 273-237.000.

Cooper, Larry V.; and Sloane, Michael W., Sr., to Ace Fishing & Rental Tools, Inc. Retrievable float valve assembly. 4,393,940, Cl. 166-325.000.

Copping, Leonard G.; Kerry, John C.; Watkins, Thomas I.; Willis, Robert J.; and Palmer, Bryan H., to Boots Company PLC, The. Compositions and method of combatting pest employing substituted benzophenone hydrozoses or semicarbazones. 4,394,387, Cl. 424-300.000.

Corning Glass Works: *See*—
Dumbaugh, William H., Jr., 4,394,453, Cl. 501-66.000.

Correa, Aderbal C.; Gergely, John S.; and Blanchard, Andrew J., to Conoco Inc. Method and apparatus for underwater detection of hydrocarbons. 4,394,573, Cl. 250-253.000.

Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. Diester antioxidants. 4,394,476, Cl. 524-289.000.

Coulter Systems Corporation: *See*—
Kuehnle, Manfred R., 4,394,084, Cl. 355-3.0BE.

Crafts, Daniel J., to Progressive Dynamics, Inc. Power converter for recreational vehicles. 4,394,706, Cl. 361-331.000.

Cragoe, Edward J., Jr., to Merck & Co., Inc. Treatment of gray matter edema. 4,394,385, Cl. 424-285.000.

Cragoe, Edward J., Jr.: *See*—
Rokach, Joshua; Rooney, Clarence S.; and Cragoe, Edward J., Jr., 4,394,515, Cl. 549-12.000.

Crane Carrier Corporation: *See*—
Knox, Arnold W., deceased, 4,393,630, Cl. 52-121.000.

Crane & Co., Inc.: *See*—
Klein, Max, 4,394,146, Cl. 55-354.000.

Crenshaw, Ronnie R.; and Algieri, Aldo A., to Bristol-Myers Company. Chemical compounds. 4,394,508, Cl. 546-209.000.

Critter Getter, Inc.: *See*—
Kaufman, Gilbert T.; and Evans, Alfred, 4,393,616, Cl. 43-60.000.

Crossley, Roger, to John Wyeth and Brother Limited. 2-[(Phenylthio)-methyl or ethyl]pyridine derivatives. 4,394,509, Cl. 546-339.000.

Croswhite, Howard L.; Liang, Po-Lung; and Fisher, Alan R., to Ford Motor Company. Infinitely variable belt-drive transmission. 4,393,731, Cl. 74-689.000.

Crouch, William B.: *See*—
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,394,137, Cl. 48-197.00R.

Crowley, Kevin J., to Converse Inc. Outsole for athletic shoe. 4,393,604, Cl. 36-67.00R.

Crummer, Marvin R.; Gold, Kenneth S.; Johnson, David G.; Vandermeyden, Tom R.; and Pelta, Edmond R., to FMC Corporation. Engine generated waveform analyzer. 4,394,742, Cl. 364-487.000.

Cuisinarts, Inc.: *See*—
Shibata, Koichiro, 4,393,737, Cl. 83-356.300.
Cummins Engine Company, Inc.: *See*—
Breeck, Philip L.; Shultz, David E.; and Rosselli, Andrew C., 4,393,825, Cl. 123-198.00F.
Cuomo, Jerome J.; Landon, Alfred J.; and Wang, Han C., to International Business Machines Corporation. Electrostatic clutch. 4,393,967, Cl. 192-84.00E.
Currie, Robert J.; Rattlingourd, Glen D.; Spencer, Billie M.; and Zscheile, John W., Jr., to Sperry Corporation. Apparatus for interleaving and de-interleaving data. 4,394,642, Cl. 340-347.0DD.
Cuscurida, Michael; Grice, Neal J.; and Speranza, George P., to Texaco Inc. Rigid polyurethane foams made from amino polyols modified with epoxy resins. 4,394,463, Cl. 521-167.000.
D & S Manufacturing: *See*—
Siebert, Steve L., 4,394,107, Cl. 414-631.000.
Dagma Deutsche Automaten und Getrankemaschinen GmbH & Co. KG: *See*—
Kuckens, Alexander, 4,393,982, Cl. 222-209.000.
Dahlberg, Anders, to Tatis Plasttatnigar AB. Protective device for a ground-deposited light. 4,394,715, Cl. 362-153.000.
Dahlberg, Reinhard, to Licenta Patent-Verwaltungs-GmbH. Method of producing electrical contacts on a silicon solar cell. 4,393,576, Cl. 29-572.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Kaneko, Toshihisa, 4,393,778, Cl. 101-425.000.
Daimler-Benz Aktiengesellschaft: *See*—
Bahrle, Friedrich; and Wulf, Helmut, 4,393,922, Cl. 165-41.000.
Bergmann, Horst; and Pracht, Hans, 4,393,831, Cl. 123-323.000.
Bergmann, Horst, 4,394,598, Cl. 313-51.000.
Hoffmann, Gerhard, 4,394,243, Cl. 204-284.000.
Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Hashimoto, Takeji; Okumoto, Kiyohumi; and Andoh, Masayasu, 4,393,670, Cl. 66-75.200.
Dakota Plastics Company: *See*—
Gallo, Joseph S., Sr., 4,393,622, Cl. 47-48.500.
Dall'Aglio, Carlo, to Finike Italiana Marposs, S.p.A. Gauge for checking linear dimensions of mechanical pieces. 4,393,592, Cl. 33-172.00B.
Dalton, Michael L., to Dalton Systems, Inc. Automatic card or tag delivery apparatus. 4,394,011, Cl. 271-107.000.
Dalton Systems, Inc.: *See*—
Dalton, Michael L., 4,394,011, Cl. 271-107.000.
Damerau, Herbert R., to Pecor Corporation. Liquid clarifier and method. 4,394,272, Cl. 210-779.000.
D'Andrea, Alfred A., Sr.: *See*—
Campagna, Thomas G.; D'Andrea, Alfred A., Sr.; and Campagna, Frank, 4,394,716, Cl. 362-158.000.
Dango & Dienenthal Maschinenbau GmbH: *See*—
Schneider, Werner, 4,393,703, Cl. 73-432.00R.
Daniel Industries Inc.: *See*—
Hinojosa, Alberto L., 4,394,023, Cl. 277-124.000.
Data General Corporation: *See*—
Bernstein, David H.; Carberry, Richard A.; Druke, Michael B.; and Gusowski, Ronald I., 4,394,736, Cl. 364-200.000.
Date, Hirohiko: *See*—
Kishida, Katsuhiro; Mekuchi, Yutaka; Hirao, Sumio; and Date, Hirohiko, 4,394,560, Cl. 219-137.0WM.
Dauson, Samuel, to PPG Industries, Inc. Durable ceramic enamel spandrels. 4,394,064, Cl. 350-259.000.
Davidson, Charles: *See*—
Larson, Ove; and Davidson, Charles, 4,393,728, Cl. 74-469.000.
Davis, Charles L.: *See*—
Apgar, Waldo D.; Davis, Charles L.; Emery, Loring D., Jr.; Esseluhn, Werner F.; and Holbrook, Walter R., 4,394,602, Cl. 315-71.000.
De Limon Fluhme GmbH & Co.: *See*—
Saretzky, Horst, 4,393,958, Cl. 184-7.00D.
De Angelis, Giancarlo; Catastini, Alberto; Bassi, Aldo; Rogora, Edoardo; Radaelli, Dario; Bertoloni, Luciano; and Perrone, Francesco, to Alfa Romeo, S.p.A. System for the regulation and control of the angle of advance for the ignition unit of an internal combustion engine. 4,393,836, Cl. 123-417.000.
Dearnaley, Geoffrey; Steeples, Kenneth; and Saunders, Ian J., to United Kingdom Atomic Energy Authority. Method of forming high resistivity regions in GaAs by deuteron implantation. 4,394,180, Cl. 148-1.500.
Debard, Andre, to Aerosol Inventions and Development AS AID SA. Vapor tap valve for aerosols. 4,393,984, Cl. 222-402.180.
De Briere, John G.; Lemanowicz, Mary M.; Richardson, David L.; and Vanderputten, Willem, to General Electric Company. Ultrasonic method and apparatus. 4,394,345, Cl. 376-245.000.
Dee, Christopher P., to Automotive Products Limited. Clutch release bearing assemblies. 4,393,968, Cl. 192-98.000.
Deemer, Carroll L.: *See*—
Satava, George L.; and Deemer, Carroll L., 4,394,194, Cl. 148-131.000.
Deere & Company: *See*—
May, Charles W., 4,393,847, Cl. 123-502.000.
Moore, James W., 4,393,645, Cl. 56-202.000.
Viaud, Jean, 4,393,764, Cl. 100-88.000.
de Fraine, Paul; Clough, John M.; and Worthington, Paul A., to Imperial Chemical Industries PLC. Azolyl-hydroxy alkanoic acid compounds. 4,394,151, Cl. 71-76.000.
de Grivel, Virginie: *See*—
Boudon, Gerard; Denis, Bernard; de Grivel, Virginie; and Mollier, Pierre, 4,394,752, Cl. 365-227.000.
Dejoux, Andre: *See*—
Desnoulez, Bruno; and Dejoux, Andre, 4,393,733, Cl. 81-3.38A.
Dekeyser, Mark A.: *See*—
Plant, Howard L.; Cantor, Steven E.; Doweyko, Arthur M.; Dekeyser, Mark A.; and Bell, Allyn R., 4,394,155, Cl. 71-94.000.
Delabie, Jacques J. A., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.". Transmission line assembly including means for reducing vibrations and method of making same. 4,394,531, Cl. 174-24.000.
De Leon, Daniel, to GTE Automatic Electric Labs Inc. Line circuit for multiple line telephone. 4,394,544, Cl. 179-99.00H.
Delhaes, Johannes C., to Rubber-en Kunststoffabriek ENBI B.V. Seal for use with pipes to be fitted one into another with spigot and socket ends. 4,394,024, Cl. 277-207.00A.
Delle Donne, Roberto, to Italtel Societa Italiana Telecomunicazioni S.p.A. Transmitting section of PCM station. 4,394,759, Cl. 370-110.100.
Delorean Research Limited Partnership: *See*—
Spooner, Colin R., 4,394,050, Cl. 297-468.000.
DeMaria, Francesco: *See*—
Pfeiffer, Ronald E.; and DeMaria, Francesco, 4,394,339, Cl. 264-177.00F.
de Nachtegaal, Jakob, to IHC Holland N.V. Hoisting yoke. 4,394,041, Cl. 294-181.00R.
deNevers, Noel H.: *See*—
Gardner, James H.; and deNevers, Noel H., 4,393,665, Cl. 62-457.000.
Deng, Peter: *See*—
Warren, Ben; White, George M.; Parfitt, Rick; and Deng, Peter, 4,394,538, Cl. 179-1.0SD.
Denis, Bernard: *See*—
Boudon, Gerard; Denis, Bernard; de Grivel, Virginie; and Mollier, Pierre, 4,394,752, Cl. 365-227.000.
Dennhardt, Werner, to Hoechst Aktiengesellschaft. Processing station for charging, exposing and developing printing masters. 4,394,085, Cl. 355-3.00R.
Dennis, Richard D., to Carrier Corporation. Electrical connector. 4,394,549, Cl. 200-16.00E.
Dentsply Research & Development Corp.: *See*—
Scheuble, Max; and Munsch, Paul, 4,394,172, Cl. 106-38.50D.
Deprez, Jacques: *See*—
Kitzelmann, Dieter; and Deprez, Jacques, 4,394,239, Cl. 204-414.000.
deRivet, Philippe-Hubert: *See*—
Bienvenu, Jacques; Dufond, Patrick; Carre, Claude; Tuong, Duc L.; Verdier, Henri; deRivet, Philippe-Hubert; Bradley, John J.; and Franklin, Benjamin S., 4,394,725, Cl. 364-200.000.
Derycke, Leon: *See*—
Mijot, Guy; Derycke, Leon; Dienne, Didier; and Martinot, Roger, 4,393,942, Cl. 172-2.000.
Desnoulez, Bruno; and Dejoux, Andre. Corkscrews with tackle reduction. 4,393,733, Cl. 81-3.38A.
Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt e.V.: *See*—
Gebhard, Werner; and Kroder, Claus, 4,393,718, Cl. 73-859.000.
De Vigili, Walter J.: *See*—
Hough, Louis E.; and De Vigili, Walter J., 4,393,754, Cl. 98-2.140.
Hough, Louis E.; De Vigili, Walter J.; and Shifflett, David C., 4,394,044, Cl. 296-218.000.
deVries, Louis; and King, John M., to Chevron Research Company. Antioxidant combinations of sulfur containing molybdenum complexes and aromatic amine compounds for lubricating oils. 4,394,279, Cl. 252-46.400.
Devuyst, Eric A.: *See*—
Ettel, Victor A.; Devuyst, Eric A.; and Illis, Alexander, 4,394,366, Cl. 423-493.000.
Diamond Communication Products, Inc.: *See*—
Leonardo, Ignazio, 4,393,549, Cl. 24-115.00A.
Diamond International Corporation: *See*—
Bixler, Kenneth D.; Lord, Henry A.; and Reifers, Richard F., 4,394,214, Cl. 162-228.000.
Dickerson, Joyce H.: *See*—
Brandt, John G.; Dickerson, Joyce H.; and Schmitt, William R., 4,394,235, Cl. 204-165.000.
Dienne, Didier: *See*—
Mijot, Guy; Derycke, Leon; Dienne, Didier; and Martinot, Roger, 4,393,942, Cl. 172-2.000.
Diesel Kiki Co., Ltd.: *See*—
Ishizuka, Yutaka, 4,394,110, Cl. 417-269.000.
Diester Concentrator Co., Inc., The: *See*—
Zipperian, Donald E., 4,394,258, Cl. 209-170.000.
Dieterich, Alfred. Shoe orthosis or shoe orthosis parts. 4,393,876, Cl. 128-583.000.
Diffracto Ltd.: *See*—
Liptay-Wagner, Nicholas; Renaud, Roland; Pryor, Timothy R.; and Clarke, Donald A., 4,394,683, Cl. 358-107.000.
diga-die gasheizung GmbH: *See*—
Boer, Hubert, 4,393,805, Cl. 118-105.000.
Di Giulio, Arnold O.: *See*—
Brown, Garrett; and Di Giulio, Arnold O., 4,394,075, Cl. 352-243.000.
Di Leo, Angela M.; and Lucia, James, to Zaromb, Solomon. Purse alarm. 4,394,644, Cl. 340-571.000.
Dilgren, Richard E.; and Owens, Kenneth B., to Shell Oil Company. Olefin sulfonate-improved steam foam drive. 4,393,937, Cl. 166-272.000.

Dills, Raymond L., to General Electric Company. Solid plate heating unit. 4,394,564, Cl. 219-449.000.

Dills, Raymond L., to General Electric Company. Power disconnect assembly for electric heating elements. 4,394,565, Cl. 219-452.000.

Di Rosa, Gaetano, to F.A.T.A. - Fabrica Apparecchi di Sollevamento e Trasporto ed Affini S.p.A. Rotary valve for controlling the flow of a solid particulate material. 4,393,892, Cl. 137-242.000.

Dirth, George P. Control system for refrigeration or air conditioning installation. 4,393,662, Cl. 62-115.000.

Disborg, Lennart, to FFV Industriprodukter AB. Method and apparatus for the assembly of long objects on a rotating shaft. 4,393,567, Cl. 29-421.00R.

Discovision Associates: *See*—
Taylor, Arnold E., 4,394,117, Cl. 425-549.000.

Disctron, Inc.: *See*—
Edwards, Roy J., 4,394,700, Cl. 360-133.000.

Divisek, Jiri; and Mergel, Jurgen, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Diaphragms for alkaline water electrolysis and method for production of the same as well as utilization thereof. 4,394,244, Cl. 204-295.000.

Dobbie, Thomas A., Jr.: *See*—
Vorhauer, Bruce W.; and Dobbie, Thomas A., Jr., 4,393,871, Cl. 609-58.000.

Dobkin, Robert C.: *See*—
Dunkley, James L.; and Dobkin, Robert C., 4,393,575, Cl. 29-571.000.

Dr. C. Otto & Comp. G.m.b.H.: *See*—
Haese, Egon; Willms, Rolf; and Schultheiss, Karl D., 4,394,363, Cl. 423-356.000.

Dr. Ing. h.c.F. Porsche AG: *See*—
Schmid, Wolfgang, 4,393,827, Cl. 123-198.00F.

Dodson, Karen E.: *See*—
Tallent, Othar K.; Dodson, Karen E.; and Mailen, James C., 4,394,269, Cl. 210-690.000.

Doherty, John, Jr., to Texas Instruments Incorporated. Two-temperature thermally responsive fast idle control switch. 4,393,834, Cl. 123-339.000.

Dola, Frank P., to AMP Incorporated. Joystick switch. 4,394,548, Cl. 200-6.00A.

Dolland, Carlisle R., to United States of America, National Aeronautics and Space Administration. Adaptive reference voltage generator for firing angle control of line-commutated inverters. 4,394,610, Cl. 318-803.000.

Dolomitwerke GmbH: *See*—
Rosener, Karlheinz; Roeder, Alfred; Munchberg, Wolfgang; Richrath, Herbert; and Chmiel, Max, 4,394,454, Cl. 501-112.000.

Donalies, Richard W. Boat rope controller. 4,393,803, Cl. 114-254.000.

Donlon, William T., Jr.: *See*—
Meitzler, Allen H.; Donlon, William T., Jr.; and Schinozaki, Samuel S., 4,394,672, Cl. 357-10.000.

Donne, Graham L.: *See*—
Armour, John S.; Watson, Peter M. F.; and Donne, Graham L., 4,393,980, Cl. 220-85.00S.

Donne, Roberto D., to Italtel Societa Italiana Telecomunicazioni, S.p.A. Synchronizing unit for receiving section of PCM station. 4,394,758, Cl. 370-105.000.

Donnelly, Vincent M.; Flamm, Daniel L.; and Karlicek, Robert F., Jr., to Bell Telephone Laboratories, Incorporated. Spectroscopic monitoring of gas-solid processes. 4,394,237, Cl. 204-192.00E.

Dornier GmbH: *See*—
Ritchie, Donald, 4,394,109, Cl. 416-142.000.

Dosch, Werner; and Wagner, Heinz, to Carlo Erba Strumentazione S.p.A. Connecting device for pneumatic and/or hydraulic circuits in column chromatography. 4,394,263, Cl. 210-198.200.

Dow Chemical Company, The: *See*—
Allada, Sambasiva R., 4,394,288, Cl. 252-350.000.
Bertelsman, Dale M.; Eckert, William M.; and Morrow, Stanley J., 4,394,455, Cl. 501-117.000.
Hoffman, Dwight K., 4,394,491, Cl. 525-452.000.
McKinney, Osborne K.; and Flores, David P., 4,394,474, Cl. 524-232.000.
Nelson, Donald L.; and Naderhoff, Bryan A., 4,394,497, Cl. 528-101.000.
Pryor, Alvetta, 4,394,284, Cl. 252-153.000.
Schrader, Paul G., 4,394,496, Cl. 528-98.000.
Smith, Harry A., 4,394,133, Cl. 44-56.000.

Doweyko, Arthur M.: *See*—
Plant, Howard L.; Cantor, Steven E.; Doweyko, Arthur M.; Dekeyser, Mark A.; and Bell, Allyn R., 4,394,155, Cl. 71-94.000.

Doyle, Francis S.; Prince, Terry B.; and Stevenson, Martin J., to Bell Telephone Laboratories, Incorporated. Construction of a telephone instrument. 4,394,545, Cl. 179-179.000.

Doyle, Holly T.: *See*—
Suchoff, Michael A.; Doyle, Holly T.; and Doyle, Robert O., 4,394,649, Cl. 340-711.000.

Doyle, Robert O.: *See*—
Suchoff, Michael A.; Doyle, Holly T.; and Doyle, Robert O., 4,394,649, Cl. 340-711.000.

Drews, Ulrich; Werner, Peter; and Mohrle, Werner, to Robert Bosch GmbH. Device for regulating the fuel-air ratio in internal combustion engines. 4,393,841, Cl. 123-440.000.

Dronet, Jean-Marc, to Societe d'Application Plastique Mecanique et Electronique Plastimecanique S.A. Forming arrangement for machines making receptacles out of thermoplastic material. 4,394,115, Cl. 425-122.000.

Druke, Michael B.: *See*—
Bernstein, David H.; Carberry, Richard A.; Druke, Michael B.; and Gusowski, Ronald L., 4,394,736, Cl. 364-200.000.

Dufond, Patrick: *See*—
Bienvenu, Jacques; Dufond, Patrick; Carre, Claude; Tuong, Duc L.; Verdier, Henri; deRivet, Philippe-Hubert; Bradley, John J.; and Franklin, Benjamin S., 4,394,725, Cl. 364-200.000.

Dukhovlinov, Sergei D.: *See*—
Aronov, Sergei A.; Bashilov, Vladimir A.; Volkov, Nikolai M.; and Dukhovlinov, Sergei D., 4,394,591, Cl. 310-11.000.

Dull, Hans J.; and Hillmer, Adolf, to Siemens Aktiengesellschaft. Track crossing for a two track suspension railroad. 4,393,786, Cl. 104-141.000.

Dumbaugh, William H., Jr., to Corning Glass Works. Envelopes for tungsten-halogen lamps. 4,394,453, Cl. 501-66.000.

Dunkley, James L.; and Dobkin, Robert C., to National Semiconductor Corporation. Process for manufacturing a JFET with an ion implanted stabilization layer. 4,393,575, Cl. 29-571.000.

Dunn, William H.; Horey, Leonard I.; and Kurland, Marvin, to Singer Company, The. Arrangement for operating an electronically controlled sewing machine in a diagnostic mode. 4,393,796, Cl. 112-158.00E.

Dunnavant, William R.: *See*—
Gruber, Bruce A.; Langer, Heimo J.; and Dunnavant, William R., 4,394,466, Cl. 523-141.000.

Du Pont de Nemours, E. I., and Company: *See*—
Aufdermarsh, Carl A., 4,394,489, Cl. 525-370.000.
Clark, Thomas R.; Lillmars, Alvin E.; Roth, Elwood A.; Schmick, Alvin L.; and Todd, Maurice C., 4,393,736, Cl. 83-100.000.
Cone, Michael M., 4,394,321, Cl. 260-439.00R.
Levitt, George, 4,394,506, Cl. 544-321.000.
Middleton, William J., 4,394,386, Cl. 424-298.000.
Milford, George N., Jr., 4,394,500, Cl. 528-313.000.
Miller, Conrad E., 4,394,442, Cl. 430-532.000.
Nair, Kumaran M., 4,394,171, Cl. 106-1.140.
Petersen, Wallace C., 4,394,314, Cl. 260-391.000.
Reap, James J., 4,394,153, Cl. 71-92.000.
Rys-Sikora, John, 4,394,459, Cl. 521-84.000.
Tomic, Ernst A., 4,394,174, Cl. 106-85.000.

Dupre, Bernard: *See*—
Loos, Horst-Rudolf; and Dupre, Bernard, 4,393,951, Cl. 177-136.000.

Dupro A.G.: *See*—
Woerwag, Peter, 4,394,606, Cl. 318-434.000.

Dutfield, James H., to Reftech Limited. Vertical refuse compactor. 4,393,767, Cl. 100-229.00A.

Dweck, Jay S.: *See*—
Mix, Thomas W.; and Dweck, Jay S., 4,394,219, Cl. 203-1.000.

Dwivedi, Basant K.: *See*—
Sampathkumar, Prathivadibhayankaram S.; and Dwivedi, Basant K., 4,394,308, Cl. 260-112.50R.

Dynamit Nobel Aktiengesellschaft: *See*—
Brede, Uwe; and Penner, Horst, 4,393,779, Cl. 102-202.500.

Eastman Kodak Company: *See*—
Anagnostopoulos, Constantine N.; and Lee, Teh-Hsung, 4,394,675, Cl. 357-24.000.
Cappel, Carl R., 4,394,440, Cl. 430-379.000.
Gysling, Henry J., 4,394,318, Cl. 260-429.00R.
Jadwin, Thomas A.; and Storey, Robert C., 4,394,430, Cl. 430-110.000.
Kasper, George P., 4,393,810, Cl. 118-657.000.
Moberg, Gregory O., 4,394,719, Cl. 363-18.000.
Van Allan, James A.; Perlstein, Jerome H.; Reynolds, George A.; and Goliber, Thomas E., 4,394,428, Cl. 430-83.000.

Eaton Corporation: *See*—
Cohen, Leonard D., 4,394,660, Cl. 343-100.0SA.
Merritt, Robert C.; and Terwilliger, Gerald L., 4,393,852, Cl. 123-564.000.

Eckert, William M.: *See*—
Bertelsman, Dale M.; Eckert, William M.; and Morrow, Stanley J., 4,394,455, Cl. 501-117.000.

Eckle, Otto; and Veigel, Helmut, to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH. Cutting plate carrier insertable in a holder of a machine tool, in particular a lathe tool. 4,393,735, Cl. 82-36.00R.

Ecolaire Incorporated: *See*—
Board, Robert D., 4,394,139, Cl. 55-20.000.

Edelman, Robert, to Celanese Corporation. Sized carbon fibers capable of use with polyimide matrix. 4,394,467, Cl. 523-205.000.

Eder Instrument Co., Inc.: *See*—
Reznik, Benjamin; Welber, Stanley; and Streifeneder, Ludwig, 4,393,872, Cl. 604-151.000.

Edwards, Roy J., to Disctron, Inc. Restraining and sealing mechanism for disc cartridge. 4,394,700, Cl. 360-133.000.

Egami, Tsuneyuki: *See*—
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,393,702, Cl. 73-204.000.

Egbert, Jason S.: *See*—
Egbert, Jeffrey T.; and Egbert, Jason S., 4,394,012, Cl. 272-119.000.

Egbert, Jeffrey T.; and Egbert, Jason S. Weighted exercise vest. 4,394,012, Cl. 272-119.000.

Egly, Richard S.; and Turnquist, Cecil E., to Angus Chemical Company. Process for rectification of propane nitration stream. 4,394,220, Cl. 203-42.000.

Eguchi, Seiji: *See*—
Suzuki, Seigo; and Eguchi, Seiji, 4,394,730, Cl. 364-200.000.

Eguchi, Shusaku: *See*—
Takahashi, Kenji; Yamazaki, Hisashi; Miyahara, Junji; Kotera, Noboru; Eguchi, Shusaku; and Miura, Norio, 4,394,581, Cl. 250-484.100.

Eguchi, Yasukata; Takenoya, Hideaki; and Sano, Yasuro, to Janome Sewing Machine Co. Ltd. Sewing machine with needle dropping hole changing control device. 4,393,794, Cl. 112-158.00E.

Eheim, Franz; and Hofer, Gerald, to Robert Bosch GmbH. RPM Governor for a fuel injection pump. 4,393,835, Cl. 123-357.000.

Eicken, Karl; Rohr, Wolfgang; and Wuerzer, Bruno, to BASF Aktiengesellschaft. N-Azolyl acetanilides, the manufacture thereof, and their use as. 4,394,513, Cl. 548-374.000.

Eidschun, Charles D., to Micro-Plate, Inc. Specific gravity level gauge and method. 4,393,705, Cl. 73-439.000.

Electra Food Machinery, Inc.: *See*—
Anmahian, Al, 4,393,758, Cl. 99-450.600.

Electric Power Research Institute, Inc.: *See*—
Bahder, George; and Rabinowitz, Mario, 4,394,534, Cl. 174-15.00S.
Bedell, John R., 4,394,006, Cl. 266-239.000.
Lapides, Melvin E., 4,393,711, Cl. 73-592.000.

Elford, Howard L.: *See*—
van't Riet, Bartholomeus; Elford, Howard L.; and Wampler, Galen L., 4,394,389, Cl. 424-308.000.

Eli Lilly and Company: *See*—
Kukolja, Stjepan; and Pfeil, Janice L., 4,394,313, Cl. 260-245.400.
Tao, Eddie V. P., 4,394,510, Cl. 548-240.000.

Elitex, koncern textilniho strojirenstvi: *See*—
Rambousek, Miroslav; and Svarc, Stanislav, 4,393,648, Cl. 57-413.000.

Elleman, Daniel D.: *See*—
Barmatz, Martin B.; Trinh, Eugene H.; Wang, Taylor G.; Elleman, Daniel D.; and Jacobi, Nathan, 4,393,708, Cl. 73-505.000.

Ellis, Edward J.; and Salamone, Joseph C., to Polymer Technology Corporation. Abrasive-containing contact lens cleaning materials. 4,394,179, Cl. 134-7.000.

Ellison, Joseph: *See*—
Willis, Frederick G.; Radtke, Richard R.; Ellison, Joseph; and Fozo, Steven R., 4,393,696, Cl. 73-117.300.

Elpo Industries, Inc.: *See*—
Kowalski, Eugene, 4,393,588, Cl. 30-196.000.

Elrod, Samuel D.: *See*—
Anderson, Charles N.; Elrod, Samuel D.; and Miller, Gerald O., 4,393,987, Cl. 228-157.000.

Emab Electrolux Motor Aktiebolag: *See*—
Barkhult, Bengt A., 4,393,589, Cl. 30-381.000.

Emerle, Emil; and Gawron, Alex F., to Skil Corporation. Battery charging circuit. 4,394,612, Cl. 320-31.000.

Emery, Loring D., Jr.: *See*—
Apgar, Waldo D.; Davis, Charles L.; Emery, Loring D., Jr.; Esseluhn, Werner F.; and Holbrook, Walter R., 4,394,602, Cl. 315-71.000.

Emhart Industries, Inc.: *See*—
Wallace, George E., 4,393,664, Cl. 62-256.000.
Weaver, Robert F., 4,394,595, Cl. 310-162.000.

Engelhard Corporation: *See*—
Gratzel, Michael; and Kiwi, John, 4,394,293, Cl. 252-430.000.

Entoleter, Inc.: *See*—
Marro, Joseph, Jr.; and Wattles, Gurdon B., 4,394,131, Cl. 44-51.000.

Epstein, Fred; and Holden, Tom, to Industrial Engineering and Equipment Incorporated. Electric immersion heater mounting flange. 4,394,562, Cl. 219-306.000.

Ergon, Inc: *See*—
Taylor, David W., 4,394,132, Cl. 44-51.000.

Erickson, Roger D., to Honeywell Inc. Electrographic recording. 4,394,671, Cl. 346-155.000.

Eriksson, Erik: *See*—
Hallqvist, Sten; and Eriksson, Erik, 4,393,748, Cl. 89-47.000.

Eriksson, Erik F. Intermeshing screw-type refiner. 4,393,983, Cl. 222-233.000.

Ermilova, Margarita M.: *See*—
Gryaznov, Vladimir M.; Smirnov, Viktor S.; Vdovin, Valentin M.; Ermilova, Margarita M.; Gogua, Liya D.; Pritula, Nina A.; and Fedorova, Galina K., 4,394,294, Cl. 252-430.000.

Ernest, Richard B.: *See*—
Hansen, David M.; and Ernest, Richard B., 4,393,684, Cl. 72-451.000.

Ertl, Wilhelm; Lachmann, Ulrich; and Pertsch, Heinrich, to Siemens Aktiengesellschaft. Magnetic gate and method of production thereof. 4,394,190, Cl. 148-31.550.

Eschenko, Vladislav Y.: *See*—
Golovanov, Alexandr V.; Eschenko, Vladislav Y.; Musaev, Irsali K.; and Talibdzhanov, Zakhidzhan S., 4,394,120, Cl. 431-284.000.

Eshbach, John R.: *See*—
Cady, William R.; Yu, SePuan; and Eshbach, John R., 4,393,578, Cl. 29-576.00B.

Eskandry, Ezra D.: *See*—
Humble, David R.; Weaver, Jon N.; Gentzler, David L.; Eskandry, Ezra D.; and Lamanna, Peter J., 4,394,645, Cl. 340-572.000.

Esseluhn, Werner F.: *See*—
Apgar, Waldo D.; Davis, Charles L.; Emery, Loring D., Jr.; Esseluhn, Werner F.; and Holbrook, Walter R., 4,394,602, Cl. 315-71.000.

Essex Group, Inc.: *See*—
Sian, Sucha S., 4,394,638, Cl. 337-264.000.

Etat Francais: *See*—
Terrien, Michel E.; and Bouvet, Claude, 4,393,533, Cl. 14-2.600.

Ettel, Victor A.; Devuyst, Eric A.; and Illis, Alexander, to Inco Limited. Process for production of $CoCl_2$ solution from cobaltic oxide-hydrate. 4,394,366, Cl. 423-493.000.

Eurand America, Inc.: *See*—
Scarpelli, Joseph A., 4,394,287, Cl. 64-4.320.

Evans, Alfred: *See*—
Kaufman, Gilbert T.; and Evans, Alfred, 4,393,616, Cl. 43-60.000.

Ewing, Neal L.: *See*—
Nava, Louis J.; and Ewing, Neal L., 4,394,394, Cl. 426-285.000.

Exalto, Robertus; and Kwakernaak, Adriaan, to Fokker B.V. Pickling of aluminum. 4,394,232, Cl. 204-144.000.

Exxon Research and Engineering Co.: *See*—
Rosensweig, Ronald E., 4,394,281, Cl. 252-62.550.
Seiver, Robert L., 4,394,282, Cl. 252-62.550.

F.A.T.A. - Fabrica Apparecchi di Sollevamento e Trasporto ed Affini S.p.A.: *See*—
Di Rosa, Gaetano, 4,393,892, Cl. 137-242.000.

Fabian, Klaus, to Hoechst Aktiengesellschaft. Process and test specimen for determining the adhesion to glass of interlayers for laminated glass by the tensile shear test. 4,393,700, Cl. 73-150.00A.

Fallon, William H.; Schober, William R.; Neukirch, Edward O.; and Kirby, Donald W., to General Battery Corporation. Method for charging a storage battery. 4,394,611, Cl. 320-21.000.

Farber, Milton; and Worns, John R., to Uniroyal, Inc. Syndiotactic polybutadiene composition for a photosensitive printing plate. 4,394,435, Cl. 430-287.000.

Favot, Guido; and Berg, Alf A., to Tekno-Detaljer Sture Carlsson AB. Spring coiling machine. 4,393,678, Cl. 72-131.000.

Fearnley, Charles: *See*—
Strasilla, Dieter; Moldovanyi, Laszlo; Fearnley, Charles; and Meindl, Hubert, 4,393,886, Cl. 132-7.000.

Fedorova, Galina K.: *See*—
Gryaznov, Vladimir M.; Smirnov, Viktor S.; Vdovin, Valentin M.; Ermilova, Margarita M.; Gogua, Liya D.; Pritula, Nina A.; and Fedorova, Galina K., 4,394,294, Cl. 252-430.000.

Feil, Paul G., to AMF Incorporated. Snap action switch. 4,394,553, Cl. 200-67.0DA.

Fengler, Hans-Jorg, to Auergesellschaft GmbH. Circuit arrangement for a gas measuring and gas analysis apparatus. 4,393,686, Cl. 73-23.000.

Fenne, Ivor: *See*—
Mowbray, Dorian F.; Fenne, Ivor; and Cavanagh, Eric J., 4,393,846, Cl. 123-502.000.

Ferm, Richard L., to Chevron Research Company. Hydroxy-aluminum/lignin sulfonate compositions. 4,394,213, Cl. 162-163.000.

Fernandez, Carlos, to Brown, Boniard I. Rock boring bit with novel teeth and geometry. 4,393,948, Cl. 175-374.000.

Ferrar, Carl M., to United Technologies Corporation. Fluidic angular rate sensor employing ionized gas. 4,393,707, Cl. 73-505.000.

FFV Industriprodukter AB: *See*—
Disborg, Lennart, 4,393,567, Cl. 29-421.00R.

Fidler, Fred: *See*—
Ball, Martin F.; and Fidler, Fred, 4,393,979, Cl. 220-270.000.

Figg, Anthony V. J., to Norprint International. Apparatus for printing and dispensing labels. 4,393,774, Cl. 101-288.000.

Filzinger, Klaus: *See*—
Fuchs, Hermann; and Filzinger, Klaus, 4,394,310, Cl. 260-162.000.

Finike Italiana Marposs, S.p.A.: *See*—
Dall'Aglio, Carlo, 4,393,592, Cl. 33-172.00B.

Finnieston, Alan. Tibia brace. 4,393,866, Cl. 128-87.00R.

Firestone Tire & Rubber Company, The: *See*—
Goetz, George W.; Santti, Arne J.; and LaLonde, Gary R., 4,394,033, Cl. 280-736.000.

Fischer, Friedrich B.; and Moser, Gottfried, to Klockner-Humboldt-Deutz AG. Heating system. 4,393,824, Cl. 123-196.0AB.

Fischer, Robert G., Jr.; and Zweig, Arnold, to American Cyanamid Company. Method for the liquid phase oxidative fluorination of aromatic compounds. 4,394,527, Cl. 570-143.000.

Fischer, Rolf: *See*—
Schnabel, Rolf; Weitz, Hans-Martin; and Fischer, Rolf, 4,394,290, Cl. 252-412.000.

Fischer, Victor H., to Thermal Systems Limited. Reciprocating external combustion engine. 4,393,653, Cl. 60-511.000.

Fisher, Alan R.: *See*—
Croswhite, Howard L.; Liang, Po-Lung; and Fisher, Alan R., 4,393,731, Cl. 74-689.000.

Fisher, Dennis H., to Ashland Oil, Inc. High energy fuel compositions. 4,394,528, Cl. 585-14.000.

Fjellheim, Petter: *See*—
Hartvig, Tor; and Fjellheim, Petter, 4,394,168, Cl. 75-126.00A.

Flamm, Daniel L.: *See*—
Donnelly, Vincent M.; Flamm, Daniel L.; and Karlicek, Robert F., Jr., 4,394,237, Cl. 204-192.00E.

Flannagan, Alfred, to Litton Systems, Inc. Light emitting diode matrix. 4,394,600, Cl. 313-500.000.

Flores, David P.: *See*—
McKinney, Osborne K.; and Flores, David P., 4,394,474, Cl. 524-232.000.

Flusche, Frederick O.; Gustafson, Richard N.; and McGilvray, Bruce L., to International Business Machines Corporation. Cache storage line shareability control for a multiprocessor system. 4,394,731, Cl. 364-200.000.

FMC Corporation: *See*—
Berkowitz, Sidney; and Mohr, Richard A., 4,394,361, Cl. 423-321.00S.
Crummer, Marvin R.; Gold, Kenneth S.; Johnson, David G.; Vandermeyden, Tom R.; and Pelta, Edmond R., 4,394,742, Cl. 364-487.000.
Gill, William A., 4,393,906, Cl. 141-387.000.
Ranbom, Wayne, 4,394,369, Cl. 423-588.000.
Shimp, Lawrence A.; and Steinhauser, John E., 4,394,396, Cl. 426-332.000.
Wilson, Donald C., 4,394,398, Cl. 426-481.000.
Fohl, to Repa Feinstanzwerk GmbH. Belt lock for a safety belt. 4,393,555, Cl. 24-230.00A.
Fokker B.V.: *See*—
Exalto, Robertus; and Kwakernaak, Adriaan, 4,394,232, Cl. 204-144.000.
Folta, Werner; and Kost, Erwin, to SMS Schloemann-Siemag Aktiengesellschaft. Traction drive for forging manipulators. 4,393,683, Cl. 72-422.000.
Ford, Michael E.; and Johnson, Thomas A., to Air Products and Chemicals, Inc. Preparation of polyalkylene polyamines from ammonia, alkyleneamine, and alkanolamine. 4,394,524, Cl. 564-479.000.
Ford Motor Company: *See*—
Chattha, Mohinder S.; and Theodore, Ares N., 4,394,486, Cl. 525-162.000.
Croswhite, Howard L.; Liang, Po-Lung; and Fisher, Alan R., 4,393,731, Cl. 74-689.000.
Meitzler, Allen H.; Donlon, William T., Jr.; and Schinozaki, Samuel S., 4,394,672, Cl. 357-10.000.
Moulding, Michael B.; Muller, Klaus; and Mack, Gerhard, 4,394,043, Cl. 296-97.00H.
Willis, Frederick G.; Radtke, Richard R.; Ellison, Joseph; and Fozo, Steven R., 4,393,696, Cl. 73-117.300.
Foremost-McKesson, Inc.: *See*—
Nava, Louis J.; and Ewing, Neal L., 4,394,394, Cl. 426-285.000.
Forshee, David J., to Syn-Trac Systems Inc. Conveyor pallet construction. 4,393,999, Cl. 248-346.000.
Fort Lock Corporation: *See*—
Scherbing, Frank J., 4,394,551, Cl. 200-44.000.
Fory, Werner: *See*—
Tobler, Hans; Fory, Werner; and Schurter, Rolf, 4,394,156, Cl. 71-94.000.
Foss, Stephen D., to General Electric Company. Method for determining dissolved gas concentrations in dielectric coolants. 4,394,635, Cl. 336-55.000.
Foster, Elton G., to Shell Oil Co. Process for recovery of chlorine from hydrogen chloride. 4,394,367, Cl. 423-502.000.
Fozo, Steven R.: *See*—
Willis, Frederick G.; Radtke, Richard R.; Ellison, Joseph; and Fozo, Steven R., 4,393,696, Cl. 73-117.300.
Frager, Jean: *See*—
Gabor, Gabriel, 4,394,720, Cl. 363-37.000.
Fralick, Stanley C.: *See*—
Widergren, Robert D.; Chen, Wen-Hsiung; Fralick, Stanley C.; and Tescher, Andrew G., 4,394,774, Cl. 382-56.000.
Frankel, Charles, to Laurel Enterprises. Jewelry clasp retaining member. 4,393,552, Cl. 24-213.00C.
Franklin, Benjamin S.: *See*—
Bienvesu, Jacques; Dufond, Patrick; Carre, Claude; Tuong, Duc L.; Verdier, Henri; deRivet, Philippe-Hubert; Bradley, John J.; and Franklin, Benjamin S., 4,394,725, Cl. 364-200.000.
Frankston, Michael; and Bezjian, Krikor A. Eastern Arabic number display. 4,394,651, Cl. 340-756.000.
Franz, James H.: *See*—
Fry, Warren C.; Franz, James H.; and Merlino, Paul J., 4,394,724, Cl. 363-124.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,393,784, Cl. 104-2.000.
Frear, David L., to Bendix Corporation, The. Electrical connector insert assembly. 4,394,058, Cl. 339-59.00R.
Freed, William K.: *See*—
Hoffman, Ronald E.; and Freed, William K., 4,393,594, Cl. 33-203.160.
Frees, Kenneth A.; and Quick, Thomas E., to Missouri Research Laboratories, Inc. Glass handling lift truck. 4,394,106, Cl. 414-622.000.
Freitag, Walter O.; and Suchodolski, Victor V., to Sperry Corporation. Making magnetic powders. 4,394,160, Cl. 75-0.5AA.
French, Paul M. Solar heat collecting apparatus. 4,393,860, Cl. 126-429.000.
Fressard, Jules: *See*—
Mandar, Andre; Fressard, Jules; and Mandar, Martine, 4,393,855, Cl. 123-587.000.
Freudenstein, Ferdinand: *See*—
Maki, Emil R.; Freudenstein, Ferdinand; Richard, Raymond L., Jr.; and Chew, Meng-Sang, 4,393,820, Cl. 123-90.410.
Frey, Volker: *See*—
Roth, Michael; and Frey, Volker, 4,394,335, Cl. 264-82.000.
Frick, Georg; Reiff, Harro; and Kirsch, Alois, to Karl Mengele & Sohne Maschinenfabrik und Eisengiesserei GmbH & Co. Method of and apparatus for cutting strips from long plates. 4,393,570, Cl. 29-560.000.
Friedman, Jack: *See*—
Boyarsky, Abraham; Friedman, Jack; Christodoulopoulos, Athanasios; and Lee, Rock, 4,393,869, Cl. 128-204.180.
Friedrich Wilh. Schwing GmbH: *See*—
Warnecke, Waldemar, 4,393,606, Cl. 37-103.000.
Fruge', James D., to Celanese Corporation. Recovery of catalytically-useful cobalt and like metal moieties from their solid oxalates with EDTA salts. 4,394,355, Cl. 423-27.000.
Fry, Warren C.; Franz, James H.; and Merlino, Paul J., to Westinghouse Electric Corp. Propulsion motor control apparatus and method. 4,394,724, Cl. 363-124.000.
Fryar, Durward; and Schmitz, Jerome J., to Procter & Gamble Company, The. Process for forming a barrier phase. 4,393,643, Cl. 53-471.000.
Fuchino, Yoshihide: *See*—
Kaneko, Koji; Fuchino, Yoshihide; and Inoue, Tsuyoshi, 4,394,169, Cl. 75-128.00A.
Fuchs, Francis J., Jr., to Western Electric Company, Inc. Methods and apparatus for casting and extruding material. 4,393,917, Cl. 164-476.000.
Fuchs, Hermann; and Filzinger, Klaus, to Hoechst Aktiengesellschaft. 1-Amino-2-sulfo-(4'-pyrazolonyl-phenyl)-aminoanthraquinone compounds and a process for their preparation. 4,394,310, Cl. 260-162.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Kataoka, Ryuji, 4,393,839, Cl. 123-440.000.
Tanaka, Takayuki; and Matsumoto, Rempei, 4,393,819, Cl. 123-41.080.
Tsukui, Minoru; Sekiguchi, Hiroshi; and Machida, Takatoshi, 4,393,956, Cl. 181-265.000.
Fuji Kocki Kabushiki Kaisha: *See*—
Takematsu, Yoshiyuki, 4,394,079, Cl. 354-33.000.
Fuji Photo Film Co., Ltd.: *See*—
Kawaguchi, Hideo; Inayama, Takayuki; Takimoto, Masaaki; and Ono, Yoshihiro, 4,394,441, Cl. 430-524.000.
Komaki, Takao; and Matsumoto, Seiji, 4,394,737, Cl. 364-414.000.
Takahashi, Kenji; Yamazaki, Hisashi; Miyahara, Junji; Kotera, Noboru; Eguchi, Shunaku; and Miura, Norio, 4,394,581, Cl. 250-484.100.
Terashita, Takaaki, 4,394,078, Cl. 354-31.000.
Fujimura, Shuzo; and Yasuda, Atsuyuki, to Fujitsu Limited. Spinner. 4,393,807, Cl. 118-501.000.
Fujioka, Akira; Sakiyama, Kazuo; Takigawa, Akio; and Yoshida, Motoaki, to Sumitomo Chemical Company, Limited; and Nippon Sheet Glass Co. Ltd. Coating composition. 4,394,177, Cl. 106-287.140.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,394,384, Cl. 424-246.000.
Fujitsu Limited: *See*—
Fujimura, Shuzo; and Yasuda, Atsuyuki, 4,393,807, Cl. 118-501.000.
Isogai, Hideaki; and Takahashi, Yukio, 4,394,657, Cl. 340-825.930.
Kurihara, Hiroshi; Takenaka, Sadao; and Itaya, Eiji, 4,394,626, Cl. 331-12.000.
Nagano, Genzo; and Takahashi, Masao, 4,394,763, Cl. 371-38.000.
Shioya, Yoshimi; Maeda, Mamoru; Takasaki, Kanetake; and Takagi, Mikio, 4,394,401, Cl. 427-39.000.
Uchiyama, Nobuhiro; Shingu, Masataka; and Tsukada, Saburo, 4,394,211, Cl. 156-628.000.
Fukushi, Kyosuke: *See*—
Ujikawa, Norihisa; and Fukushi, Kyosuke, 4,394,480, Cl. 525-43.000.
Fukushima, Hatahiko; Handa, Tadahiko; and Kodama, Kenji, to Air Products and Chemicals, Inc. Process for the production of blow molded articles accompanied with the recovery of a blowing gas. 4,394,333, Cl. 264-37.000.
Fukuto, Tetsuo R.: *See*—
Kawata, Mitsuyasu; Umetsu, Noriharu; and Fukuto, Tetsuo R., 4,394,383, Cl. 424-285.000.
Funke, Rolf: *See*—
Bickle, Wolfgang; Funke, Rolf; and Pfoh, Rolf, 4,394,275, Cl. 252-12.000.
Furukawa, Hideo; Chikugo, Kazuo; and Otsuki, Yoichi, to Kabushiki Kaisha Komatsu Seisakusho. Suction valve seat lubricating apparatus. 4,393,823, Cl. 123-196.00M.
Furukawa, Takashi; and Koyama, Kazuo, to Nippon Steel Corporation. Method for producing a dual-phase steel sheet having excellent formability, high artificial-aging hardenability after forming, high strength, low yield ratio, and high ductility. 4,394,186, Cl. 148-12.00F.
Futaba Denshi Kogyo K.K.: *See*—
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,394,210, Cl. 156-608.000.
Fuwa, Masaru, to Mitsubishi Petrochemical Company Limited. Production of elongated fiber-reinforced composite articles. 4,394,338, Cl. 264-135.000.
Gabor, Gabriel, to Frager, Jean. Auto-stabilized high power electric generator especially adapted for powering processes involving discharge in a rarefied gaseous atmosphere. 4,394,720, Cl. 363-37.000.
Gagliani, John; and Long, John V. Modified polyimide foams and methods of making same. 4,394,464, Cl. 521-180.000.
Gajajiva, Padej; and Wium, Eigil, to General Signal Corporation. Insert plug. 4,393,900, Cl. 138-89.000.
Galkin, Benjamin M.; Boon, Raymond; Gilliam, Rudolph V.; and Park, Chan H., to Thomas Jefferson University. Syringe shields and methods for using same. 4,393,864, Cl. 128-1.100.
Gallo, Joseph S., Sr., to Dakota Plastics Company. Water funnel and card holder for cut flowers. 4,393,622, Cl. 47-48.500.
Gardiner, James R; Makarewicz, Stanley R.; Revitz, Martin; and Shepard, Joseph F., to International Business Machines Corp. Double polysilicon contact structure and process. 4,394,406, Cl. 427-86.000.

Gardiner, William P., to W. G. Slow T. (a partnership). Rotary engine. 4,393,829, Cl. 123-249.000.
Gardner, James H.; and deNevers, Noel H., to Aurora Design Associates, Inc. Server for wine bottles and the like. 4,393,665, Cl. 62-457.000.
Gardner, Lloyd E., to Phillips Petroleum Company. Catalytic hydrocracking, hydrodesulfurization, and/or hydrodenitrogenation of organic compounds employing promoted zinc titanate and a zeolite as the catalytic agent. 4,394,301, Cl. 252-455.00Z.
Garrett Corporation, The: *See*—
Clark, Walter L.; and Sutton, Trevor G., 4,393,692, Cl. 73-115.000.
Garrison, Barney D., Jr.; and Marjanovich, Barry S., to Canadian Superior Oil Ltd. Sulphur-clay prills. 4,394,150, Cl. 71-62.000.
Gas Research Institute: *See*—
Grunes, Howard E.; and Morrison, Dennis J., 4,393,663, Cl. 62-119.000.
Gasparini, Aldo; and Wimnell, Nils E., to Gasparini, Aldo; and Wimnell, Nils Erik. Extruded snap-fastening for slats and metal awning made therewith. 4,393,629, Cl. 52-74.000.
Gast, Richard A., to General Motors Corporation. Dual-monolith catalytic converter with secondary air injection. 4,394,351, Cl. 422-171.000.
Gatsis, John G., to UOP Inc. Coal liquefaction process. 4,394,248, Cl. 208-10.000.
Gatzke, Kenneth G., to Minnesota Mining and Manufacturing Company. Diazonium imaging system. 4,394,433, Cl. 430-151.000.
Gaudenzi, Gene J., to International Business Machines Corporation. Controllable di/dt push/pull driver. 4,394,588, Cl. 307-443.000.
Gawron, Alex F.: *See*—
Emerle, Emil; and Gawron, Alex F., 4,394,612, Cl. 320-31.000.
Gebhard, Werner; and Kroder, Claus, to Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt e.V. Assembly for stress testing material under high temperatures. 4,393,718, Cl. 73-859.000.
Gebhart, Siegfried. Apparatus for milling building blocks. 4,393,856, Cl. 125-3.000.
Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H.: *See*—
Schupphaus, Herbert, 4,394,053, Cl. 299-81.000.
Gelhard, Egon. Cylinder lock and key assembly. 4,393,672, Cl. 70-277.000.
Gellekink, Bernard, to Hollandse Signaalapparaten B.V. Monopulse radar with pilot signal generator. 4,394,659, Cl. 343-16.00M.
General Battery Corporation: *See*—
Fallon, William H.; Schober, William R.; Neukirch, Edward O.; and Kirby, Donald W., 4,394,611, Cl. 320-21.000.
General DataComm Industries, Inc.: *See*—
Shum, Martin N. Y., 4,394,767, Cl. 375-13.000.
General Dynamics Corporation/Convair Div.: *See*—
Hujsak, Edward J.; and Stocker, Hans M., 4,393,541, Cl. 16-297.000.
General Electric Company: *See*—
Anthony, Thomas R., 4,394,712, Cl. 361-411.000.
Cady, William R.; Yu, SePuan; and Eshbach, John R., 4,393,578, Cl. 29-576.00B.
De Briere, John G.; Lemanowicz, Mary M.; Richardson, David L.; and Vanderputten, Willem, 4,394,345, Cl. 376-245.000.
Dills, Raymond L., 4,394,564, Cl. 219-449.000.
Dills, Raymond L., 4,394,565, Cl. 219-452.000.
Foss, Stephen D., 4,394,635, Cl. 336-55.000.
Houston, John M.; and Whetten, Nathan R., 4,394,578, Cl. 250-374.000.
Kenyon, S. Wayne; Geyer, Bernard H., Jr.; and Nelson, Conrad E., 4,394,630, Cl. 333-116.000.
Vakil, Himanshu B., 4,393,661, Cl. 62-113.000.
General Foods Corporation: *See*—
Kleiner, Fredric; and Zemelman, Valery B., 4,393,660, Cl. 62-69.000.
General Instrument Corporation: *See*—
Breeze, Eric G., 4,394,653, Cl. 340-802.000.
General Motors Corporation: *See*—
Gast, Richard A., 4,394,351, Cl. 422-171.000.
Johnston, Daniel U.; and Shinkle, George A., 4,393,688, Cl. 73-35.000.
Klomp, Edward D., 4,394,091, Cl. 384-101.000.
Long, Donald A.; and Sowash, Thomas R., 4,394,555, Cl. 200-159.00R.
Maki, Emil R.; Freudenstein, Ferdinand; Richard, Raymond L., Jr.; and Chew, Meng-Sang, 4,393,820, Cl. 123-90.410.
Murphy, James E.; and Reid, Kenneth H., 4,394,034, Cl. 280-801.000.
Rieck, Gerald C., 4,393,994, Cl. 239-585.000.
General Signal Corporation: *See*—
Gajajiva, Padej; and Wium, Eigil, 4,393,900, Cl. 138-89.000.
Gentzler, David L.: *See*—
Humble, David R.; Weaver, Jon N.; Gentzler, David L.; Eskandry, Ezra D.; and Lamanna, Peter J., 4,394,645, Cl. 340-572.000.
George F. and Irene Sherrill 1978 Trust No. 1: *See*—
Sherrill, George F., 4,394,381, Cl. 424-274.000.
George F. and Irene Sherrill 1978 Trust No. 2: *See*—
Sherrill, George F., 4,394,381, Cl. 424-274.000.
Geosource Inc.: *See*—
Browne, Edward M.; and Smither, Miles A., 4,394,616, Cl. 324-52.000.
Gerber, B. Lynn. Remotely adjustable sighting device for tractors. 4,393,596, Cl. 33-264.000.
Gercekci, Anil, to Motorola, Inc. Prom erase detector. 4,394,750, Cl. 365-218.000.
Gergely, John S.: *See*—
Correa, Aderbal C.; Gergely, John S.; and Blanchard, Andrew J., 4,394,573, Cl. 250-253.000.
Gettys Manufacturing Co., Inc.: *See*—
Tryber, Robert E.; and Hoffman, George A., 4,394,608, Cl. 318-578.000.
Gewerkschaft Schalker Eisenhutte: *See*—
Holz, Wilhelm; Lukaszewicz, Helmut; and Gregor, Karl, 4,394,217, Cl. 202-227.000.
Geyer, Bernard H., Jr.: *See*—
Kenyon, S. Wayne; Geyer, Bernard H., Jr.; and Nelson, Conrad E., 4,394,630, Cl. 333-116.000.
Geyer, Gerd: *See*—
Janicki, Max; Liefke, Hans-Georg; Keil, Reinhart; and Geyer, Gerd, 4,394,609, Cl. 318-603.000.
Geze GmbH: *See*—
Storandt, Ralf; Richert, Manfred; and Scheck, Georg, 4,394,032, Cl. 280-618.000.
Gfrerer, Manfred, to Siemens Aktiengesellschaft. Method and device for the continuous, contactless monitoring of the structure state of cold strip. 4,394,193, Cl. 148-129.000.
Gibler, David L.; and O'Connell, Daniel J., to United States of America, Air Force. Removable secondary aircraft fuel enclosure. 4,393,997, Cl. 244-135.00R.
Gibson, Dale E., to Leupold & Stevens, Inc. Tube adjustment gasket and rifle scope employing same. 4,393,595, Cl. 33-245.000.
Gibson, Kirk R., to Chevron Research Company. Large pore shaped hydroprocessing catalysts. 4,394,303, Cl. 252-470.000.
Gielisse, Peter J., to L.C.E. Ltd. Method and apparatus for analyzing gems. 4,394,580, Cl. 250-461.100.
Gijzen, Wilhelmus A. H., to U.S. Philips Corporation. Bearing arrangement for an objective of an optical apparatus for writing and/or reading recording tracks by means of a radiation beam. 4,394,755, Cl. 369-45.000.
Gill, William A., to FMC Corporation. Stern to bow offshore loading system. 4,393,906, Cl. 141-387.000.
Gilliam, Rudolph V.: *See*—
Galkin, Benjamin M.; Boon, Raymond; Gilliam, Rudolph V.; and Park, Chan H., 4,393,864, Cl. 128-1.100.
Gilmore, Richard F. Mechanically expandable annular seal. 4,394,022, Cl. 277-36.000.
Girardi, Richard V.: *See*—
Stratta, Julius J.; Robeson, Lloyd M.; and Girardi, Richard V., 4,394,469, Cl. 523-212.000.
GKN Stenman AB: *See*—
Widen, Bo G., 4,393,673, Cl. 70-358.000.
Glaxo Group Limited: *See*—
Clitherow, John W., 4,394,516, Cl. 549-495.000.
Gleim, William K. T. Method of reforming gasoline to raise the octane thereof utilizing low valence Ti, V or Cr composited with non-oxidizing high surface area support. 4,394,252, Cl. 208-134.000.
Glotfelter, Herman E. High security transaction drawer. 4,393,789, Cl. 109-19.000.
Gnyra, Bohdan, to Alcan International Limited. Method for curtailing phosphorous impurity in the production of hydrogen fluoride. 4,394,365, Cl. 423-485.000.
Goad, Bobby F.: *See*—
Muse, John F.; Callihan, Rudy B.; Goad, Bobby F.; and Wainwright, Clyde S., Jr., 4,393,931, Cl. 166-208.000.
Gocho, Yoshitsugu, to Tokyo Shibaura Denki Kabushiki Kaisha. Liquid cooled dynamoelectric machines. 4,394,593, Cl. 310-54.000.
Goes, Michael J.; Masly, John R.; and Schmidlin, Albertus E., to United States of America, Army. Fluidic range-safe explosive device. 4,393,783, Cl. 102-529.000.
Goettsche, Mark T. Sound display apparatus having separation control. 4,394,656, Cl. 340-825.730.
Goetz, George W.; Santti, Arne J.; and LaLonde, Gary R., to Firestone Tire & Rubber Company, The. Temperature compensating elastic cone. 4,394,033, Cl. 280-736.000.
Goff, James R. Apparatus for separating abrasive blasting media from debris. 4,394,256, Cl. 209-135.000.
Gogua, Liya D.: *See*—
Gryaznov, Vladimir M.; Smirnov, Viktor S.; Vdovin, Valentin M.; Ermilova, Margarita M.; Gogua, Liya D.; Pritula, Nina A.; and Fedorova, Galina K., 4,394,294, Cl. 252-430.000.
Gold, Kenneth S.: *See*—
Crummer, Marvin R.; Gold, Kenneth S.; Johnson, David G.; Vandermeyden, Tom R.; and Pelta, Edmond R., 4,394,742, Cl. 364-487.000.
Goldstein, Neal: *See*—
Willis, Alan E.; Lowdenslager, John R.; and Goldstein, Neal, 4,394,540, Cl. 179-2.0AM.
Goletto, Jean: *See*—
Pusineri, Christian; and Goletto, Jean, 4,394,462, Cl. 521-137.000.
Goliber, Thomas E.: *See*—
Van Allan, James A.; Perlstein, Jerome H.; Reynolds, George A.; and Goliber, Thomas E., 4,394,428, Cl. 430-83.000.
Golimowski, Jerzy; Sipos, Laszlo; and Valenta, Paul, to Kernforschungsanlage Julich GmbH. Method of making a measuring electrode assembly and electrode made thereby. 4,394,238, Cl. 204-400.000.
Golovanov, Alexandr V.; Eschenko, Vladislav Y.; Musaev, Irsali K.; and Talibdzhanov, Zakhidzhan S., to Srednеaziatsky Filial Vniipromgaz. Burner. 4,394,120, Cl. 431-284.000.

Gons, Johan: *See*—
Kuibers-Kiewik, Walfrida G. E.; Akkerman, Johannes; and Gons, Johan, 4,394,501, Cl. 528-485.000.

Gonzalez, Ruben J.: *See*—
Borras, Jaime A.; Gonzalez, Ruben J.; Smith, Daniel M.; and Wieczorek, Alfred B., 4,394,776, Cl. 455-76.000.

Goodyear Tire & Rubber Company, The: *See*—
Cottman, Kirkwood S., 4,394,476, Cl. 524-289.000.
Hoffman, Ronald E.; and Freed, William K., 4,393,594, Cl. 33-203.160.
Tung, William C. T., 4,394,490, Cl. 525-438.000.

Gorans, Marc S., to Phillips Temro, Inc. Diesel fuel temperature controlling apparatus. 4,393,851, Cl. 123-557.000.

Gordon, Bruce W.: *See*—
Lowery, Richard E.; Gordon, Bruce W.; and Steger, Barry N., 4,394,323, Cl. 260-446.000.

Gosselink, Eugene P., to Procter & Gamble Company, The. Alpha-oxyalkylene amine oxide compounds useful in detergents. 4,394,305, Cl. 252-528.000.

Gossler, Gerhard. Temperature indicator for a glass ceramic cooking surface. 4,394,646, Cl. 340-594.000.

Gotze, Gerd-Wolfgang; and Muller, Manfred, to Robert Bosch GmbH. Audiometer with photo sensitive, digitally tunable low distortion oscillator. 4,394,627, Cl. 331-66.000.

Gouda, Osamu: *See*—
Kato, Masahisa; Kasugai, Syouji; and Gouda, Osamu, 4,393,801, Cl. 112-282.000.

Goudsche Machinefabriek B.V.: *See*—
van der Schoot, Peter W. C., 4,393,756, Cl. 99-348.000.

Gould, Gilbert, to United States of America, Navy. Cam operated switch assembly. 4,394,556, Cl. 200-161.000.

Gounder, Raj N., to RCA Corporation. Solar cell array with lightweight support structure. 4,394,529, Cl. 136-245.000.

Gouttebessis, Jacques, to Compagnie Generale des Etablissements Michelin. Process for the manufacture of tires by molding. 4,393,912, Cl. 152-353.00R.

Grabis, Dietrich W., to United International California Corporation. System for recovering methane gas from liquid waste. 4,394,136, Cl. 48-111.000.

Graf, Manfred, to Rheinmetall GmbH. Fuze for liquid shell propellants. 4,393,781, Cl. 102-440.000.

Grandguillot, Michel J.; Mollier, Pierre B.; and Nuez, Jean-Paul J., to International Business Machines Corp. High density integrated read-only memory. 4,394,747, Cl. 365-104.000.

Gratzel, Michael; and Kiwi, John, to Engelhard Corporation. Catalyst for the photolytic production of hydrogen from water. 4,394,293, Cl. 252-430.000.

Grau, James A.; and Hertzog, Russel C., to Schlumberger Technology Corporation. Methods and apparatus for constituent analysis of earth formations. 4,394,574, Cl. 250-262.000.

Grawey, Charles E.; and Groezinger, John J., to Caterpillar Tractor Co. Tire and wheel configuration. 4,393,913, Cl. 152-364.000.

Gray, Thomas J., to Olin Corporation. Raney alloy coated cathode for chlor-alkali cells. 4,394,228, Cl. 204-98.000.

Great Lakes Carbon Corporation: *See*—
Karagoz, Berch Y., 4,394,766, Cl. 373-120.000.

Green, Geoffrey W.; and Lettington, Alan H., to National Research Development Corporation. Method and apparatus for depositing coatings in a glow discharge. 4,394,400, Cl. 427-38.000.

Greene, George H.: *See*—
Bartkovitz, David J.; and Greene, George H., 4,394,493, Cl. 525-530.000.

Greer, James B., to Lone Star Steel Company. High performance tubulars for critical oil country applications and improved process for their preparation. 4,394,189, Cl. 148-12.00R.

Gregor, Karl: *See*—
Holz, Wilhelm; Lukaszewicz, Helmut; and Gregor, Karl, 4,394,217, Cl. 202-227.000.

Greier, Josef: *See*—
Obermayer, Bertram; Skatsche, Othmar; and Greier, Josef, 4,393,822, Cl. 123-195.00R.

Grice, Neal J.: *See*—
Cuscurida, Michael; Grice, Neal J.; and Speranza, George P., 4,394,463, Cl. 521-167.000.

Griffiths, Martin G.: *See*—
Hardy, Francis R. F.; and Griffiths, Martin G., 4,394,348, Cl. 420-528.000.

Groezinger, John J.: *See*—
Grawey, Charles E.; and Groezinger, John J., 4,393,913, Cl. 152-364.000.

Grof, Helmut: *See*—
Reimpell, Uwe; Grof, Helmut; Knell, Franz-Georg; and Wamser, Anton, 4,394,765, Cl. 373-52.000.

Grosjean, Pierre, to Rhone-Poulenc-Textile. Pile extile articles and process and device for their manufacture. 4,394,200, Cl. 156-72.000.

Grossberg, Arnold L., to Chevron Research Company. Delayed coking process. 4,394,250, Cl. 208-108.000.

Grossi, Anthony V.; Hagelee, Leon A.; Hahn, Louis T.; and Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Cationic arcylamide and rubber modified asphalts. 4,394,481, Cl. 525-54.500.

Groteke, Daniel E. Apparatus and method for filtration of molten metal. 4,394,271, Cl. 210-773.000.

Groves, William N., to Research Corporation. Exhaust gas recirculation type internal combustion engines and method of operating same. 4,393,853, Cl. 123-568.000.

Gruber, Bruce A.; Langer, Heimo J.; and Dunnavant, William R., to Ashland Oil, Inc. Fulvene binder compositions. 4,394,466, Cl. 523-141.000.

Grudler, Francois: *See*—
Brecy, Andre; and Grudler, Francois, 4,394,604, Cl. 318-257.000.

Grunes, Howard E.; and Morrison, Dennis J., to Gas Research Institute. Two-phase thermosyphon heater. 4,393,663, Cl. 62-119.000.

Grunzweig & Hartmann und Glasfaser AG: *See*—
Kummermehr, Hans, 4,394,337, Cl. 264-122.000.

Gryaznov, Vladimir M.; Smirnov, Viktor S.; Vdovin, Valentin M.; Ermilova, Margarita M.; Gogua, Liya D.; Pritula, Nina A.; and Fedorova, Galina K. Membrane catalyst for hydrogenation of organic compounds and method for preparing same. 4,394,294, Cl. 252-430.000.

Gschwandtner, Martin, to Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft. Hall probe with automatic connecting means. 4,394,619, Cl. 324-117.00H.

GTE Automatic Electric Incorporated: *See*—
Schroeder, Scott L., 4,394,061, Cl. 350-96.200.

GTE Automatic Electric Labs Inc.: *See*—
Butcher, James S., 4,394,703, Cl. 361-101.000.
Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, 4,394,728, Cl. 364-200.000.
De Leon, Daniel, 4,394,544, Cl. 179-99.00H.

GTE Products Corporation: *See*—
Brower, Boyd G.; and Shaffer, John W., 4,394,709, Cl. 361-401.000.
Brower, Boyd G.; Broadt, David R.; and Shaffer, John W., 4,394,710, Cl. 361-401.000.

Gugger, Hans; and Ackland, John, to Warman International Limited. Drill rig. 4,393,944, Cl. 173-28.000.

Guilbault, Lawrence J.: *See*—
Wade, Robert C.; and Guilbault, Lawrence J., 4,394,226, Cl. 204-72.000.

Guillemot, Philippe, to Mecilec. Digital pressure-measuring device. 4,393,713, Cl. 73-701.000.

Gulati, Harish C.: *See*—
Turner, John T.; Gulati, Harish C.; Hall, William B.; and Watson, Arnold, 4,393,721, Cl. 73-861.210.

Gulf Research & Development Company: *See*—
Beach, David L.; and Harrison, James J., 4,394,322, Cl. 260-440.000.
Madgavkar, Ajay M.; and Swift, Harold E., 4,394,296, Cl. 252-433.000.
Vogel, Roger F.; Marcelin, George; and Swift, Harold E., 4,394,525, Cl. 568-462.000.

Gunter, Claude R.: *See*—
Cameron, Erma C.; Gunter, Claude R.; and White-Stevens, Rodric H., 4,394,444, Cl. 435-11.000.

Gupta, Surendra K.: *See*—
Brock, David A.; and Gupta, Surendra K., 4,394,450, Cl. 435-191.000.

Gurak, Ronald W.: *See*—
Sauer, L. Peter; and Gurak, Ronald W., 4,393,763, Cl. 100-2.000.

Gusowski, Ronald I.: *See*—
Bernstein, David H.; Carberry, Richard A.; Druke, Michael B.; and Gusowski, Ronald I., 4,394,736, Cl. 364-200.000.

Gustafson, Richard N.: *See*—
Flusche, Frederick O.; Gustafson, Richard N.; and McGilvray, Bruce L., 4,394,731, Cl. 364-200.000.

Gustavsson, Olle; and Sundmar, Goran, to Aktiebolaget Bofors. Loading table. 4,393,747, Cl. 89-45.000.

Gusyatsky, Iosif A.: *See*—
Azarevich, Gennady M.; Gusyatsky, Iosif A.; Savelieva, Lidia B.; and Akimov, Boris I., 4,393,675, Cl. 72-71.000.

Gysling, Henry J., to Eastman Kodak Company. Tellurium (II) compounds and complexes having organic moieties containing silicon. 4,394,318, Cl. 260-429.00R.

Gyugyi, Laszlo: *See*—
Brennen, Michael B.; Gyugyi, Laszlo; and Stacey, Eric J., 4,394,614, Cl. 323-210.000.

H. B. Fuller Company: *See*—
Clausen, Victor H.; and Asbury, Charles E., 4,394,206, Cl. 156-322.000.
Lee, Jeffrey A.; and Todd, Mike J., 4,393,534, Cl. 15-98.000.

Haese, Egon; Willms, Rolf; and Schultheiss, Karl D., to Dr. C. Otto & Comp. G.m.b.H. Process for the granulation of precipitation products formed from ammonium compounds. 4,394,363, Cl. 423-356.000.

Haeussler, Ernst. Concrete slab assembly, especially for building facades. 4,394,201, Cl. 156-73.600.

Hagelee, Leon A.: *See*—
Grossi, Anthony V.; Hagelee, Leon A.; Hahn, Louis T.; and Marzocchi, Alfred, 4,394,481, Cl. 525-54.500.

Hahn, Louis T.: *See*—
Grossi, Anthony V.; Hagelee, Leon A.; Hahn, Louis T.; and Marzocchi, Alfred, 4,394,481, Cl. 525-54.500.

Hakey, Mark C.: *See*—
Bergendahl, Albert S.; Hakey, Mark C.; and Wilson, John P., 4,394,437, Cl. 430-312.000.

Hakl, Josef, to Sandoz Ltd. Separation of boric acid from mixtures thereof with sulphuric acid. 4,394,364, Cl. 423-483.000.

Hall, Leslie C., Jr., to AMP Incorporated. One step applicator tool. 4,393,580, Cl. 29-749.000.

Hall, R. Dean, to United States of America, Air Force. Tin and gold plating process. 4,394,223, Cl. 204-15.000.

Hall, William B.: *See*—
Turner, John T.; Gulati, Harish C.; Hall, William B.; and Watson, Arnold, 4,393,721, Cl. 73-861.210.

Halliburton Services: *See*—
Smith, Charles W.; and Borchardt, John K., 4,393,939, Cl. 166-293.000.

Hallqvist, Sten; and Eriksson, Erik, to Aktiebolaget Bofors. Device for stripper. 4,393,748, Cl. 89-47.000.

Hamada, Masa: *See*—
Umezawa, Hamao; Shimada, Nobuyoshi; Naganawa, Hiroshi; Takita, Tomohisa; Hamada, Masa; and Takeuchi, Tomio, 4,394,446, Cl. 435-88.000.

Hamamatsu Systems, Inc.: *See*—
Iida, Hitoshi; and King, Pay-Shin, 4,394,688, Cl. 358-160.000.

Hamasaki, Yoshiharu: *See*—
Wakamiya, Yoshinori; Hamasaki, Yoshiharu; Kutsuzawa, Masaki; and Mitsubishi Denki Kabushiki Kaisha, 4,394,121, Cl. 432-11.000.

Hamashima, Tetsuo; and Kumano, Fumihiro, to Matsushita Electric Works, Ltd. Shaving blade assembly for rotary type electric shaver. 4,393,586, Cl. 30-43.600.

Hammer, Hartmut: *See*—
Stage, Hermann; Hammer, Hartmut; and Kuhns, Walter, 4,394,221, Cl. 203-89.000.

Hammers, P. Fred: *See*—
Wilson, James G., II; and Hammers, P. Fred, 4,393,565, Cl. 29-157.30R.

Han, Moon H.; and Seong, Baik L., to Korea Advanced Institute of Science and Technology. Process for preparing rifamycin derivatives. 4,394,312, Cl. 260-239.30P.

Hanamoto, Hiroyuki; and Horie, Yoshihiro, to Minolta Camera Kabushiki Kaisha. Copying machine. 4,394,088, Cl. 355-14.00R.

Handa, Masao: *See*—
Tamura, Manabu; Kamemura, Yoshiki; and Handa, Masao, 4,393,677, Cl. 72-97.000.

Handa, Tadahiko: *See*—
Fukushima, Hatahiko; Handa, Tadahiko; and Kodama, Kenji, 4,394,333, Cl. 264-37.000.

Hannum, Roy R., to Union Carbide Corporation. Method of producing a vanadium- and nitrogen-containing material for use as an addition to steel. 4,394,161, Cl. 75-0.5BC.

Hansen, David M.; and Ernest, Richard B., to Penn Engineering & Manufacturing Corp. Press having a linkage mechanism connectable and disconnectable from a ram. 4,393,684, Cl. 72-451.000.

Hansen, Jens, to Robert Bosch GmbH. Method and system for receiving distortion-free FM signals by vehicular radios. 4,394,779, Cl. 455-277.000.

Hanyu, Yoshiaki: *See*—
Suzuki, Yoshihisa; Kaizuka, Takanoli; Hanyu, Yoshiaki; Otake, Mituyoshi; and Hidano, Yoichi, 4,394,404, Cl. 427-48.000.

Hara, Hiroshi: *See*—
Hara, Michio; Tomimori, Akinobu; and Hara, Hiroshi, 4,394,542, Cl. 179-81.00B.

Hara, Michio; Tomimori, Akinobu; and Hara, Hiroshi, to Nippon Electric Co., Ltd. Telephone transmission circuit. 4,394,542, Cl. 179-81.00B.

Harada, Hiroshi: *See*—
Ito, Tadahiko; Arao, Toshio; Satoh, Nobuo; and Harada, Hiroshi, 4,394,472, Cl. 524-100.000.

Harada, Seiki: *See*—
Homma, Yoshio; Tsunekawa, Sukeyoshi; Morisaki, Hiroshi; and Harada, Seiki, 4,394,245, Cl. 204-298.000.

Harase, Jirou; and Nakayama, Tadashi, to Nippon Steel Corporation. Process for producing ferrite stainless steel sheets having excellent workability. 4,394,188, Cl. 148-12.0EA.

Hardy, Francis R. F.; and Griffiths, Martin G., to Interox Chemicals Ltd. Process for the preparation of aluminium alloys. 4,394,348, Cl. 420-528.000.

Hardy, Kenneth D.: *See*—
Bentley, Peter H.; Hardy, Kenneth D.; and Milner, Peter H., 4,394,375, Cl. 424-114.000.

Hardy, Thomas A.; and Liu, Sophia Y., to Stauffer Chemical Company. Phosphonate derivatives of polyalkylene polyamines as flame retardants. 4,394,330, Cl. 260-932.000.

Hargett, Francis B., to AMF Incorporated. Belt loop folder and feed apparatus. 4,393,800, Cl. 112-265.100.

Harris, Raymond P., to United States of America, National Aeronautics and Space Administration. Holding fixture for a hot stamping press. 4,393,777, Cl. 101-407.0BP.

Harrison, James J.: *See*—
Beach, David L.; and Harrison, James J., 4,394,322, Cl. 260-440.000.

Hartl, Roland; and Helm, Dieter, to Rohm GmbH. Synthetic stool. 4,394,452, Cl. 436-66.000.

Hartmann, Achim; and Schinkitz, Dieter, to Kronos Titan-G.m.b.H. Apparatus for the chemical conditioning of sludges. 4,394,270, Cl. 210-726.000.

Hartvig, Tor; and Fjellheim, Petter, to A/S Raufoss Ammunisjonsfabrikker. Austenitic wear resistant steel. 4,394,168, Cl. 75-126.00A.

Harumatsu, Masatoshi; Tomoyori, Makoto; and Tsushima, Noboru, to Alps Electric Co., Ltd. Direction detection apparatus. 4,393,709, Cl. 73-505.000.

Harumatsu, Masatoshi, to Alps Electric Co., Ltd. Composite switch assembly. 4,394,546, Cl. 200-5.00R.

Hasegawa, Jun: *See*—
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, 4,393,966, Cl. 192-56.00R.

Hasegawa, Shumpei: *See*—
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,393,842, Cl. 123-440.000.
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,393,843, Cl. 123-440.000.

Hasegawa, Tokuichiro. Juicer. 4,393,760, Cl. 99-510.000.

Hashimoto, Takeji; Okumoto, Kiyohumi; and Andoh, Masayasu, to Dainippon Screen Seizo Kabushiki Kaisha. Automatic knitting needle selection device. 4,393,670, Cl. 66-75.200.

Hashimoto, Teiji; and Saito, Syuichiro, to Canon Kabushiki Kaisha. Magnetically controlled shutter. 4,394,081, Cl. 354-234.000.

Hattori, Tadashi: *See*—
Nishida, Minoru; Hattori, Tadashi; and Tanaka, Akira, 4,393,850, Cl. 123-536.000.

Hawley, Gil R., to Phillips Petroleum Company. Polyolefin polymerization process and catalyst. 4,394,291, Cl. 252-429.00B.

Haworth, Inc.: *See*—
Wisniewski, Joseph M., 4,394,001, Cl. 248-542.000.

Hawrylo, Frank Z., to RCA Corporation. Light emitting device with a continuous layer of copper covering the entire header. 4,394,679, Cl. 357-81.000.

Hawthorne, V. T. Method of eliminating truck hunting in railway trucks. 4,393,957, Cl. 184-3.00R.

Hayama, Masashi: *See*—
Tamai, Kiminori; and Hayama, Masashi, 4,394,420, Cl. 428-447.000.

Hayashi, Satoshi: *See*—
Miyake, Mikio; Kitoh, Shinya; and Hayashi, Satoshi, 4,394,494, Cl. 526-301.000.

Hays, Dan A., to Xerox Corporation. Development process and apparatus. 4,394,429, Cl. 430-102.000.

Hazeltine, Cynthia, executor: *See*—
Helda, Robert W., deceased; Hazeltine, Cynthia, executor; and Liaw, H. Ming, 4,394,352, Cl. 422-232.000.

Hazelwood Enterprises Limited: *See*—
Cole, Denis B.; and Trethewy, Derek C., 4,393,640, Cl. 53-69.000.

Heckethorn, John E.; and Whittle, Danny J., to Heckethorn Manufacturing Company. U-Bolt clamp with tubular reinforcing means. 4,393,559, Cl. 24-277.000.

Heckethorn Manufacturing Company: *See*—
Heckethorn, John E.; and Whittle, Danny J., 4,393,559, Cl. 24-277.000.

Hein, Norman W., Jr.: *See*—
Peterson, Marvin L.; Hein, Norman W., Jr.; and Oertle, Donald H., 4,394,577, Cl. 250-372.000.

Heintges, Siegfried; Strauss, Werner; and Weiffen, Karl-Heinz, to Klockner-Humboldt-Deutz AG. Control device for a rotary valve-controlled jigging machine. 4,394,260, Cl. 209-500.000.

Hejlesen, Christian: *See*—
Berthelsen, Ernst R.; and Hejlesen, Christian, 4,394,207, Cl. 156-578.000.

Helda, Robert W., deceased; by Hazeltine, Cynthia, executor; and Liaw, H. Ming, to Motorola, Inc. Melt recharge apparatus. 4,394,352, Cl. 422-232.000.

Hellemaa, Heikki: *See*—
Samuel, Olof; and Hellemaa, Heikki, 4,393,832, Cl. 123-327.000.

Hellemans, Julianus J.: *See*—
Plessers, Hendrik S.; and Hellemans, Julianus J., 4,393,642, Cl. 53-266.00R.

Heller, Kenneth S.: *See*—
Thimons, Edward D.; Heller, Kenneth S.; McCoy, John F., III; and Whillier, Austin, 4,394,142, Cl. 55-242.000.

Hellouin de Cenival, Bruno: *See*—
Cadars, Patrick; and Hellouin de Cenival, Bruno, 4,394,141, Cl. 55-195.000.

Helm, Dieter: *See*—
Hartl, Roland; and Helm, Dieter, 4,394,452, Cl. 436-66.000.

Hempel, Gerd: *See*—
Bohnenkamp, Wulf; and Hempel, Gerd, 4,393,658, Cl. 60-657.000.

Hennessy Industries, Inc.: *See*—
Leeper, Charles G., 4,393,914, Cl. 157-1.200.

Hepburn, Derek R.: *See*—
Hydes, Paul C.; and Hepburn, Derek R., 4,394,319, Cl. 260-429.00R.

Herb, Philip J., to Thomas & Betts Corporation. Folded head cable tie and methods for making and using the same. 4,393,548, Cl. 24-16.0PB.

Herbrand, Josef: *See*—
Schimion, Werner; and Herbrand, Josef, 4,394,264, Cl. 210-222.000.

Hercofina: *See*—
Millick, William H., III, 4,394,286, Cl. 252-182.000.

Hertel, James E., to Weyerhaeuser Company. Composite wood article and method of manufacture. 4,394,409, Cl. 428-36.000.

Hertzog, Russel C.: *See*—
Grau, James A.; and Hertzog, Russel C., 4,394,574, Cl. 250-262.000.

Herwegh, Karl J.; and Modderkolk, Rutger, to Nederlandse Pillo-Pak Maatschappij B.V. Fastener for sheet material. 4,393,558, Cl. 24-230.00R.

Hess, George M.; and Zils, James A., to Russell, Burdsall & Ward Corporation. Roller side bearing mounting system and method. 4,393,787, Cl. 105-199.0CB.

Hewlett-Packard Company: *See*—
Severson, Eugene K., 4,394,682, Cl. 358-73.000.

Heyden, Gunter, to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG. Cutting roll for producing shaped inner

and outer cuts and a method for making same. 4,393,738, Cl. 83-663.000.
Heymer, Gero: *See*—
Maurer, Alexander; Adrian, Renate; Panter, Herbert; Heymer, Gero; and Nolker, Dieter, 4,394,358, Cl. 423-305.000.
Hibino, Masahiro: *See*—
Shima, Kenji; and Hibino, Masahiro, 4,394,536, Cl. 179-1.00G.
Shima, Kenji; and Hibino, Masahiro, 4,394,537, Cl. 179-1.00G.
Hidano, Yoichi: *See*—
Suzuki, Yoshihisa; Kaizuka, Takanoli; Hanyu, Yoshiaki; Otake, Mituyoshi; and Hidano, Yoichi, 4,394,404, Cl. 427-48.000.
Higuera, Robert S.; and Ryan, John F., to Northern Telecom, Inc. Tiltable support bracket for slidably supporting quartz support tubes for semiconductor wafer processing boards, and processing apparatus embodying such brackets. 4,394,123, Cl. 432-253.000.
Hildebrandt, Christian, to Volkswagenwerk Aktiengesellschaft. Passive safety belt arrangement. 4,394,036, Cl. 280-804.000.
Hilker, George D., to Phelps Dodge Industries, Inc. Apparatus for manufacturing magnet wire. 4,393,809, Cl. 118-620.000.
Hilker, George D., to Phelps Dodge Industries, Inc. Magnet wire. 4,394,417, Cl. 428-383.000.
Hill, Berlie R.: *See*—
Wang, Kenneth Y.; and Hill, Berlie R., 4,394,208, Cl. 156-580.100.
Hillmer, Adolf: *See*—
Dull, Hans J.; and Hillmer, Adolf, 4,393,786, Cl. 104-141.000.
Hilti Aktiengesellschaft: *See*—
Lutze, Uwe; Scholz, Dieter; and Brennsteiner, Ernst, 4,393,947, Cl. 175-323.000.
Hinch, Barry: *See*—
Nappholz, Tibor A.; Hinch, Barry; and Shaw, David B., 4,393,874, Cl. 128-419.0PT.
Hinojosa, Alberto L., to Daniel Industries Inc. High temperature valve stem packing with coiled graphite seal rings. 4,394,023, Cl. 277-124.000.
Hirai, Shinichiro: *See*—
Hussain, Anwar A.; Hirai, Shinichiro; and Bawarshi, Rima, 4,394,390, Cl. 424-330.000.
Hirai, Tadaaki: *See*—
Tsukada, Toshihisa; Takasaki, Yukio; Hirai, Tadaaki; Baji, Toru; Yamamoto, Hideaki; Tanaka, Yasuo; Maruyama, Eiichi; and Ishioka, Sachio, 4,394,749, Cl. 365-106.000.
Hiraku, Imaizumi; and Tadashi, Mitsui, to TDK Electronics Co., Ltd. Structure of a transformer. 4,394,636, Cl. 336-172.000.
Hirano, Masachika: *See*—
Kirino, Osamu; Hirano, Masachika; Takeda, Hisami; and Kato, Toshiro, 4,394,379, Cl. 424-211.000.
Hirao, Sumio: *See*—
Kishida, Katsuhiro; Mekuchi, Yutaka; Hirao, Sumio; and Date, Hirohiko, 4,394,560, Cl. 219-137.0WM.
Hirko, Richard G.; Ju, Kochan; and Sanders, Ian L., to International Business Machines Corporation. Swap gate for ion-implanted contiguous-disk bubble devices. 4,394,746, Cl. 365-36.000.
Hirosawa, Katsu, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic excavator. 4,393,607, Cl. 37-103.000.
Hitachi, Ltd.: *See*—
Asahi, Naotatsu; Yamaguchi, Sizuka; and Terakado, Katsuyoshi, 4,394,234, Cl. 204-164.000.
Homma, Yoshio; Tsunekawa, Sukeyoshi; Morisaki, Hiroshi; and Harada, Seiki, 4,394,245, Cl. 204-298.000.
Nakatsu, Yoshinobu, 4,394,568, Cl. 235-475.000.
Sakai, Masao, 4,393,681, Cl. 72-329.000.
Sato, Kanemasa; Ueno, Sadayasu; and Miya, Kazuhiko, 4,393,697, Cl. 73-118.000.
Suzuki, Yoshihisa; Kaizuka, Takanoli; Hanyu, Yoshiaki; Otake, Mituyoshi; and Hidano, Yoichi, 4,394,404, Cl. 427-48.000.
Takahashi, Toru; and Ueno, Sadayasu, 4,393,720, Cl. 73-861.050.
Tsukada, Toshihisa; Takasaki, Yukio; Hirai, Tadaaki; Baji, Toru; Yamamoto, Hideaki; Tanaka, Yasuo; Maruyama, Eiichi; and Ishioka, Sachio, 4,394,749, Cl. 365-106.000.
Wada, Yasuo; Usui, Hiroo; Ohkura, Makoto; Miyao, Masanobu; Tamura, Masao; and Tokuyama, Takashi, 4,394,191, Cl. 148-33.100.
Hitachi Medical Corporation: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Murayama, Hideo; Ishimatsu, Kenji; Ogushi, Akira; and Takami, Katsumi, 4,394,576, Cl. 250-366.000.
Hitachi Metals, Ltd.: *See*—
Inoue, Akira, 4,394,030, Cl. 280-434.000.
Hobes, Victor J.; and Payer, Wolfgang, to Ruhechemie Aktiengesellschaft. Saponification of ethylene copolymers suspended in ketone. 4,394,483, Cl. 525-60.000.
Hodel, Eugenio D. Liner for a water bed. 4,393,531, Cl. 5-451.000.
Hodge, John R. Land forming and earth moving equipment. 4,393,608, Cl. 37-124.000.
Hodshire, Vincent B. Fishing apparatus. 4,393,615, Cl. 43-15.000.
Hoechst Aktiengesellschaft: *See*—
Dennhardt, Werner, 4,394,085, Cl. 355-3.00R.
Fabian, Klaus, 4,393,700, Cl. 73-150.00A.
Fuchs, Hermann; and Filzinger, Klaus, 4,394,310, Cl. 260-162.000.
Maurer, Alexander; Adrian, Renate; Panter, Herbert; Heymer, Gero; and Nolker, Dieter, 4,394,358, Cl. 423-305.000.
Schrodter, Klaus; and Lehr, Klaus, 4,394,360, Cl. 423-317.000.
Springer, Hartmut, 4,394,129, Cl. 8-543.000.
Wasel-Nielen, Horst-Dieter; Maurer, Alexander; and Adrian, Renate, 4,394,359, Cl. 423-305.000.
Hoeffkes, Russell W.: *See*—
Wiese, John M.; and Hoeffkes, Russell W., 4,394,111, Cl. 417-360.000.
Hofer, Gerald: *See*—
Eheim, Franz; and Hofer, Gerald, 4,393,835, Cl. 123-357.000.
Hoff, Michael H., to NL Industries, Inc. Defoamers for aqueous liquids containing soluble zinc salts. 4,394,273, Cl. 252-8.55R.
Hoffman, Dwight K., to Dow Chemical Company, The. Addition polymerizable adduct of a polymeric monoahl and an unsaturated isocyanate. 4,394,491, Cl. 525-452.000.
Hoffman, George A.: *See*—
Tryber, Robert E.; and Hoffman, George A., 4,394,608, Cl. 318-578.000.
Hoffman, James M., Jr.; and Lux, Richard A., to Xerox Corporation. Particle containment apparatus. 4,394,086, Cl. 355-3.00R.
Hoffman, John P., to Caterpillar Tractor Co. Power supply circuit. 4,394,723, Cl. 363-87.000.
Hoffman, Myron A.: *See*—
Werner, Richard W.; and Hoffman, Myron A., 4,394,344, Cl. 376-146.000.
Hoffman, Ronald E.; and Freed, William K., to Goodyear Tire & Rubber Company, The. Collapsible scriber assembly. 4,393,594, Cl. 33-203.160.
Hoffman, Roy L.; Houdek, Merle E.; Loen, Larry W.; and Soltis, Frank G., to International Business Machines Corporation. Multi-processor task dispatching apparatus. 4,394,727, Cl. 364-200.000.
Hoffmann, Gerhard, to Daimler-Benz Aktiengesellschaft. Electrode for an electrochemical metal machine process. 4,394,243, Cl. 204-284.000.
Hoffmann-La Roche Inc.: *See*—
Trybulski, Eugene J., 4,394,311, Cl. 260-239.0BB.
Hofmann-Cerfontaine, Hellmut W., to Porst, Hannsheinz. Identification device. 4,394,654, Cl. 340-825.340.
Hogenson, Raymond A., to Minnesota Mining and Manufacturing Company. Sheet feeder. 4,394,010, Cl. 271-22.000.
Hokushin Industries Corporation: *See*—
Tarumi, Noriyoshi; Tsuchiya, Hiroshi; Kokiso, Masakazu; and Ohta, Hiroaki, 4,394,340, Cl. 264-219.000.
Holbrook, Walter R.: *See*—
Apgar, Waldo D.; Davis, Charles L.; Emery, Loring D., Jr.; Esseluhn, Werner F.; and Holbrook, Walter R., 4,394,602, Cl. 315-71.000.
Holden, Tom: *See*—
Epstein, Fred; and Holden, Tom, 4,394,562, Cl. 219-306.000.
Hollandse Signaalapparaten B.V.: *See*—
Gellekink, Bernard, 4,394,659, Cl. 343-16.00M.
Holmgren, Frank E. Foot operated vehicle. 4,394,029, Cl. 280-11.230.
Holz, Wilhelm; Lukaszewicz, Helmut; and Gregor, Karl, to Ruhrkohle Aktiengesellschaft; and Gewerkschaft Schalker Eisenhutte. Apparatus for servicing coke ovens. 4,394,217, Cl. 202-227.000.
Holzle, Gerd; Reinert, Gerhard; and Polony, Rudolf, to Ciba-Geigy Corporation. Process for bleaching textiles and for combating microorganisms with sulfonated phthalocyanine of aluminum or zinc and containing halogen or cyano substituents as photoactivator. 4,394,125, Cl. 8-103.000.
Homma, Yoshio; Tsunekawa, Sukeyoshi; Morisaki, Hiroshi; and Harada, Seiki, to Hitachi, Ltd. Sputtering apparatus. 4,394,245, Cl. 204-298.000.
Honda, Akira, to International Rectifier Corp. Japan Ltd. Field effect transistor circuit arrangement. 4,394,590, Cl. 307-584.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Okabe, Yousuke; and Shoji, Osamu, 4,394,331, Cl. 261-18.00B.
Honda Motor Co., Ltd.: *See*—
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,393,842, Cl. 123-440.000.
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,393,843, Cl. 123-440.000.
Honeywell Inc.: *See*—
Clark, John L., 4,394,761, Cl. 371-8.000.
Erickson, Roger D., 4,394,671, Cl. 346-155.000.
Horlacher, Wilhelm H., 4,394,097, Cl. 403-360.000.
Hu, Chi P., 4,394,632, Cl. 333-218.000.
Jurisson, Jaan, 4,394,571, Cl. 250-216.000.
Kasprzyk, Donald J., 4,394,708, Cl. 361-399.000.
Kopp, Gerald F., 4,394,665, Cl. 346-76.00R.
Honeywell Information Systems Inc.: *See*—
Long, Nicholas R.; Peisel, William E.; Ryan, Joseph L.; and Watkins, Richard R., 4,394,650, Cl. 340-728.000.
Honma, Juri: *See*—
Amano, Toshio; Nagai, Kunio; and Honma, Juri, 4,394,691, Cl. 358-194.100.
Horey, Leonard I.: *See*—
Dunn, William H.; Horey, Leonard I.; and Kurland, Marvin, 4,393,796, Cl. 112-158.00E.
Horie, Yoshihiro: *See*—
Hanamoto, Hiroyuki; and Horie, Yoshihiro, 4,394,088, Cl. 355-14.00R.
Horlacher, Wilhelm H., to Honeywell, Inc. Retaining apparatus. 4,394,097, Cl. 403-360.000.
Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Friction reducing additives and compositions thereof. 4,394,278, Cl. 252-46.300.
Horstmann, Winfried, to Robert Bosch GmbH. Method and system for correcting time base errors in broadband signals stored in or transmitted through a plurality of narrow-band channels. 4,394,686, Cl. 358-134.000.

Hortnagel, Franz, to R. Stahl GmbH & Co., Firma. Suspended track for monorail suspended trolleys. 4,393,785, Cl. 104-110.000.
Hosel, Fritz, to Trutzschler GmbH & Co. KG. Method and apparatus for the output control in a carding machine. 4,393,547, Cl. 19-105.000.
Hospal-Sodip, S.A.: *See*—
Pusineri, Christian; and Goletto, Jean, 4,394,462, Cl. 521-137.000.
Houdek, Merle E.: *See*—
Hoffman, Roy L.; Houdek, Merle E.; Loen, Larry W.; and Soltis, Frank G., 4,394,727, Cl. 364-200.000.
Hough, Louis E.; and De Vigili, Walter J. Air deflection assembly for vehicle sunroofs. 4,393,754, Cl. 98-2.140.
Hough, Louis E.; De Vigili, Walter J.; and Shifflett, David C. Removable sunroof for vehicles. 4,394,044, Cl. 296-218.000.
Houston, John M.; and Whetten, Nathan R., to General Electric Company. High pressure, high resolution xenon x-ray detector array. 4,394,578, Cl. 250-374.000.
Hsu, Ed C.: *See*—
Temple, Chester S.; and Hsu, Ed C., 4,394,475, Cl. 524-262.000.
Hu, Chi P., to Honeywell Inc. Millimeter-wave odd harmonic frequency multiplier. 4,394,632, Cl. 333-218.000.
Huang, Ho-Chung: *See*—
Kumar, Mahesh; Menna, Raymond J.; and Huang, Ho-Chung, 4,394,629, Cl. 333-109.000.
Huber, Peter; August, Peter; Lampelzammer, Helga; and Primas, Willi, to Wacker-Chemie GmbH. Organic fibers having improved slip properties. 4,394,518, Cl. 556-424.000.
Huffman, William A.: *See*—
Brown, Harvey A.; and Huffman, William A., 4,394,070, Cl. 350-349.000.
Hughes Aircraft Company: *See*—
Lull, John M., 4,394,769, Cl. 377-116.000.
Hujsak, Edward J.; and Stocker, Hans M., to General Dynamics Corporation/Convair Div. Hinge for deployable structures self locking hinge. 4,393,541, Cl. 16-297.000.
Humble, David R.; Weaver, Jon N.; Gentzler, David L.; Eskandry, Ezra D.; and Lamanna, Peter J., to Sensormatic Electronics Corporation. Electrical surveillance apparatus with moveable antenna elements. 4,394,645, Cl. 340-572.000.
Hussain, Anwar A.; Hirai, Shinichiro; and Bawarshi, Rima, to University of Kentucky Research Foundation. Nasal dosage forms of propranol. 4,394,390, Cl. 424-330.000.
Hutcheson, James L., to Reynolds Metals Company. Method for heat sealing. 4,394,204, Cl. 156-275.100.
Hutt, Peter R.; and Moyce, John J. Apparatus for decoding digital information processed for inclusion in wide band T.V. video signal. 4,394,687, Cl. 358-147.000.
Hyde, Robert L., to TRW Inc. Process timing apparatus. 4,394,090, Cl. 368-121.000.
Hydes, Paul C.; and Hepburn, Derek R., to Johnson Matthey Public Limited Company. Co-ordination compound of platinum. 4,394,319, Cl. 260-429.00R.
I/O Corporation: *See*—
Suchoff, Michael A.; Doyle, Holly T.; and Doyle, Robert O., 4,394,649, Cl. 340-711.000.
Ida, Yoshio, to Tsudakoma Kogyo Kabushiki Kaisha. Weft feeler unit for a fluid-jet loom. 4,393,903, Cl. 139-370.200.
Ideal Toy Corporation: *See*—
Orbanes, Philip; and Cooper, Julius, 4,394,018, Cl. 273-237.000.
Igarashi, Ryokichi: *See*—
Tsuji, Tadashi; and Igarashi, Ryokichi, 4,393,899, Cl. 138-89.000.
Igarashi, Taenji: *See*—
Shima, Michitsune; Kihara, Shiso; Omichi, Takeo; Igarashi, Taenji; and Mangetsu, Kenji, 4,393,920, Cl. 165-11.00A.
Igata, Kouichi; and Kobayashi, Masaaki, to Matsushita Electric Industrial Co., Ltd. Recording time mode detector. 4,394,701, Cl. 360-137.000.
IHC Holland N.V.: *See*—
de Nachtegaal, Jakob, 4,394,041, Cl. 294-181.00R.
van Drimmelen, Nicolaas J.; Barneveld Binkhuysen, James P.; van Renssen, Johan; and Verboom, Pieter, 4,394,265, Cl. 210-242.300.
Iida, Hitoshi; and King, Pay-Shin, to Hamamatsu Systems, Inc. Video system having an adjustable digital gamma correction for contrast enhancement. 4,394,688, Cl. 358-160.000.
Ikeda, Masami: *See*—
Sugitani, Hiroshi; Matsuda, Hiroto; Kimura, Koichi; and Ikeda, Masami, 4,394,670, Cl. 346-140.00R.
Ikeguchi, Shigehiko; and Tanaka, Kouzi, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co. Ltd. Tuning control apparatus of receiver. 4,394,778, Cl. 455-182.000.
Illis, Alexander: *See*—
Ettel, Victor A.; Devuyst, Eric A.; and Illis, Alexander, 4,394,366, Cl. 423-493.000.
Imai, Kazuo, to Nippon Telegraph & Telephone Public Corp. Semiconductor devices and method of manufacturing the same. 4,393,577, Cl. 29-576.00B.
Imanishi, Shozo, to Aida Engineering, Ltd. Feed bar driving apparatus for a transfer press. 4,393,682, Cl. 72-405.000.
IMI (Tami) Institute for Research & Development Ltd.: *See*—
Ravey, Manny, 4,394,306, Cl. 252-609.000.
Imperial Chemical Industries PLC: *See*—
Balasubramanyan, Sugavanam; and Shephard, Margaret C., 4,394,380, Cl. 424-269.000.
de Fraine, Paul; Clough, John M.; and Worthington, Paul A., 4,394,151, Cl. 71-76.000.
Imran, Mir; and Kolenik, Steve, to Mirowski, Mieczyslaw. Heart rate detector. 4,393,877, Cl. 128-705.000.
Inagaki, Mitsukane: *See*—
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, 4,393,966, Cl. 192-56.00R.
Inagaki, Osamu: *See*—
Kato, Hiroshi; Ato, Hisataka; Inagaki, Osamu; and Matsuo, Hiroshi, 4,394,666, Cl. 346-82.000.
Inayama, Takayuki: *See*—
Kawaguchi, Hideo; Inayama, Takayuki; Takimoto, Masaaki; and Ono, Yoshihiro, 4,394,441, Cl. 430-524.000.
Inco Limited: *See*—
Ettel, Victor A.; Devuyst, Eric A.; and Illis, Alexander, 4,394,366, Cl. 423-493.000.
Industrial Engineering and Equipment Incorporated: *See*—
Epstein, Fred; and Holden, Tom, 4,394,562, Cl. 219-306.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Brescia, Riccardo, 4,394,668, Cl. 346-139.00R.
Conta, Renato, 4,393,591, Cl. 33-1.00L.
Inland Steel Company: *See*—
Rastogi, Prabhat K., 4,394,192, Cl. 148-120.000.
Inoue, Akira, to Hitachi Metals, Ltd. King pin connecting mechanism. 4,394,030, Cl. 280-434.000.
Inoue, Eiichi: *See*—
Shimizu, Isamu; Shirai, Shigeru; and Inoue, Eiichi, 4,394,425, Cl. 430-65.000.
Shimizu, Isamu; Shirai, Shigeru; and Inoue, Eiichi, 4,394,426, Cl. 430-65.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,394,558, Cl. 219-69.00W.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. EDM Method of machining workpieces with a controlled crater configuration. 4,394,558, Cl. 219-69.00W.
Inoue, Takashi: *See*—
Satoh, Shingo; Inoue, Takashi; Naki, Minoru; and Kawauchi, Yuji, 4,394,165, Cl. 75-60.000.
Inoue, Tsuyoshi: *See*—
Kaneko, Koji; Fuchino, Yoshihide; and Inoue, Tsuyoshi, 4,394,169, Cl. 75-128.00A.
Institut Francais du Petrole: *See*—
Renon, Henri; and Richon, Dominique, 4,393,689, Cl. 73-64.200.
Institute po Metaloznanie i Technologia na Metalite: *See*—
Vutov, Stancho H.; and Slavov, Rashko R., 4,393,916, Cl. 164-119.000.
Interconnection Technology, Inc.: *See*—
Conley, Larry R., 4,394,711, Cl. 361-408.000.
International Business Machines Corporation: *See*—
Bergendahl, Albert S.; Hakey, Mark C.; and Wilson, John P., 4,394,437, Cl. 430-312.000.
Boudon, Gerard; Denis, Bernard; de Grivel, Virginie; and Mollier, Pierre, 4,394,752, Cl. 365-227.000.
Cuomo, Jerome J.; Landon, Alfred J.; and Wang, Han C., 4,393,967, Cl. 192-84.00E.
Flusche, Frederick O.; Gustafson, Richard N.; and McGilvray, Bruce L., 4,394,731, Cl. 364-200.000.
Gardiner, James R.; Makarewicz, Stanley R.; Revitz, Martin; and Shepard, Joseph F., 4,394,406, Cl. 427-86.000.
Gaudenzi, Gene J., 4,394,588, Cl. 307-443.000.
Grandguillot, Michel J.; Mollier, Pierre B.; and Nuez, Jean-Paul J., 4,394,747, Cl. 365-104.000.
Hirko, Richard G.; Ju, Kochan; and Sanders, Ian L., 4,394,746, Cl. 365-36.000.
Hoffman, Roy L.; Houdek, Merle E.; Loen, Larry W.; and Soltis, Frank G., 4,394,727, Cl. 364-200.000.
Landon, Alfred J.; Pennebaker, William B.; and Wang, Han C., 4,393,769, Cl. 101-93.300.
Norgren, Kent S.; and Vogelsberg, Robert E., 4,394,734, Cl. 364-200.000.
Ottman, John C.; and Shen, John C. S., 4,393,628, Cl. 51-281.0SF.
Rohen, James E., 4,394,621, Cl. 324-163.000.
Shirley, Robert E., 4,394,693, Cl. 358-298.000.
Thompson, Richard D.; Tsaur, Boryeu; and Tu, King-Ning, 4,394,673, Cl. 357-15.000.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M., 4,394,285, Cl. 252-174.110.
International Playtex, Inc.: *See*—
O'Boyle, Dolores; and Shonk, Phyllis, 4,393,875, Cl. 128-425.000.
International Power Technology, Inc.: *See*—
Cheng, Dah Yu, 4,393,649, Cl. 60-39.050.
International Rectifier Corp. Japan Ltd.: *See*—
Honda, Akira, 4,394,590, Cl. 307-584.000.
Interox Chemicals Ltd.: *See*—
Hardy, Francis R. F.; and Griffiths, Martin G., 4,394,348, Cl. 420-528.000.
Mounsey, Diana M.; and Mobbs, David B., 4,394,357, Cl. 423-140.000.
Ipanema Company: *See*—
Kemper, Yves J., 4,393,964, Cl. 192-.044.
Ipco Corporation: *See*—
Weissman, Bernard, 4,393,539, Cl. 16-114.00R.
Irie, Yutaka; Nagata, Kenzo; and Ito, Hideo, to Minolta Camera Kabushiki Kaisha. Mechanical arrangement for controlling electrophotographic apparatus. 4,394,087, Cl. 355-14.00E.
Irwin, Greg W.: *See*—
Irwin, Warren W.; and Irwin, Greg W., 4,394,046, Cl. 297-132.000.
Irwin, Warren W.; and Irwin, Greg W. Convertible rocker and high chair. 4,394,046, Cl. 297-132.000.

Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,393,532, Cl. 8-149.100.
Ishii, Fumio; and Kishi, Kenichi, to Konishiroku Photo Industry Co., Ltd. Method for manufacturing p- and o-benzoquinone derivatives. 4,394,315, Cl. 260-396.00R.
Ishii, Toshiaki, to Mitsubishi Denki Kabushiki Kaisha. Thyristor power converter with switched impedance. 4,394,721, Cl. 363-44.000.
Ishikawa, Ken, to Tokyo Shibaura Denki Kabushiki Kaisha. Laser processing apparatus. 4,394,764, Cl. 372-38.000.
Ishikawa, Tadashi: *See*—
Kaminae, Hiroshi; and Ishikawa, Tadashi, 4,394,376, Cl. 424-150.000.
Ishimatsu, Kenji: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Murayama, Hideo; Ishimatsu, Kenji; Ogushi, Akira; and Takami, Katsumi, 4,394,576, Cl. 250-366.000.
Ishioka, Sachio: *See*—
Tsukada, Toshihisa; Takasaki, Yukio; Hirai, Tadaaki; Baji, Toru; Yamamoto, Hideaki; Tanaka, Yasuo; Maruyama, Eiichi; and Ishioka, Sachio, 4,394,749, Cl. 365-106.000.
Ishizuka, Yutaka, to Diesel Kiki Co., Ltd. Swash-plate type compressor. 4,394,110, Cl. 417-269.000.
Isogai, Hideaki; and Takahashi, Yukio, to Fujitsu Limited. Decoder circuit. 4,394,657, Cl. 340-825.930.
Italtel Societa Italiana Telecomunicazioni S.p.A.: *See*—
Delle Donne, Roberto, 4,394,759, Cl. 370-110.100.
Donne, Roberto D., 4,394,758, Cl. 370-105.000.
Itaya, Eiji: *See*—
Kurihara, Hiroshi; Takenaka, Sadao; and Itaya, Eiji, 4,394,626, Cl. 331-12.000.
Ito, Hajime. Apparatus for dyeing fiber by utilizing microwaves. 4,393,671, Cl. 68-5.00C.
Ito, Hideo: *See*—
Irie, Yutaka; Nagata, Kenzo; and Ito, Hideo, 4,394,087, Cl. 355-14.00E.
Ito, Tadahiko; Arao, Toshio; Satoh, Nobuo; and Harada, Hiroshi, to Japan Synthetic Rubber Co., Ltd. Stabilized polyisoprene composition. 4,394,472, Cl. 524-100.000.
ITT Industries, Inc.: *See*—
Wagner, Wilfried, 4,393,750, Cl. 91-376.00R.
Iwai, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of etching, refilling and etching dielectric grooves for isolating micron size device regions. 4,394,196, Cl. 148-187.000.
Iwata, Hiroshi: *See*—
Yoshino, Tsunemi; Kashihara, Toshitsugu; Iwata, Hiroshi; and Morioka, Akitoshi, 4,394,077, Cl. 354-25.000.
Izumi, Masao; Yoshida, Hiroshi; and Yoshikawa, Yukio, to Nissan Motor Co., Ltd.; and Tokyo Sokuhan Co., Ltd. Fluid outlet structure. 4,393,897, Cl. 137-831.000.
Izumi, Masao; Yoshida, Hiroshi; and Yoshikawa, Yukio, to Nissan Motor Co., Ltd. Fluid outlet device and a method of controlling fluid flow through a nozzle. 4,393,898, Cl. 137-831.000.
J T Thorpe Company: *See*—
Byrd, Carlisle O., Jr., 4,393,569, Cl. 29-460.000.
J. Wagner GmbH: *See*—
Kille, Ewald; and Zimmermann, Guido, 4,393,993, Cl. 239-332.000.
Jackson, Kenneth A.; and Kimerling, Lionel C., to Bell Telephone Laboratories, Incorporated. Solidification of molten materials. 4,394,183, Cl. 148-1.500.
Jackson, Robert K.: *See*—
McDermott, Thomas R.; and Jackson, Robert K., 4,393,634, Cl. 52-309.100.
Jacobi, Nathan: *See*—
Barmatz, Martin B.; Trinh, Eugene H.; Wang, Taylor G.; Elleman, Daniel D.; and Jacobi, Nathan, 4,393,708, Cl. 73-505.000.
Jacobs, Allen W. Demand inhaler for oral administration of tobacco, tobacco-like, or other substances. 4,393,884, Cl. 131-273.000.
Jacobs, Wilson E. Sunflower seed dehulling machine. 4,393,762, Cl. 99-609.000.
Jacobsen, Kenneth J.; and Moshofsky, Jerome F. Stove pipe heat extractor. 4,393,925, Cl. 165-122.000.
Jacquard, Paul: *See*—
Picard, Jean-Francois; and Jacquard, Paul, 4,393,597, Cl. 33-275.00G.
Jadwin, Thomas A.; and Storey, Robert C., to Eastman Kodak Company. Electrophotographic dry toner and developer compositions. 4,394,430, Cl. 430-110.000.
Jaecklin, Andre, to BBC Brown, Boveri & Company, Limited. Thyristor for low-loss triggering of short impulses with Schottky contact to control gate electrode. 4,394,677, Cl. 357-38.000.
Jager, Berend; Brink, Andries; and Kleynjan, Cornelis, to Sasol One (Proprietary) Limited. Apparatus for converting coal into liquid products. 4,394,215, Cl. 196-14.520.
Jager, Horst; Plattner, Eric; Bersier, Jacques; and Comninellis, Christos, to Ciba-Geigy AG. Electrochemical process for the preparation of benzanthrones and planar, polycyclic aromatic oxygen-containing compounds. 4,394,227, Cl. 204-73.00R.
James, David E.: *See*—
Puskas, Imre; and James, David E., 4,394,299, Cl. 252-447.000.
Janicki, Max; Liefke, Hans-Georg; Keil, Reinhart; and Geyer, Gerd, to Veb Kombinat Polygraph "Werner Lamberz". Control provision operation for printing machines. 4,394,609, Cl. 318-603.000.
Janke, Elden W., to Teradyne, Inc. Drawer locking mechanism. 4,394,056, Cl. 312-216.000.
Janome Sewing Machine Co. Ltd.: *See*—
Eguchi, Yasukata; Takenoya, Hideaki; and Sano, Yasuro, 4,393,794, Cl. 112-158.00E.
Makabe, Hachiro; Watanabe, Kazuo; Takenoya, Hideaki; Kume, Toshiaki; and Kakinuma, Toshihide, 4,393,795, Cl. 112-158.00E.
Japan Synthetic Rubber Co., Ltd.: *See*—
Ito, Tadahiko; Arao, Toshio; Satoh, Nobuo; and Harada, Hiroshi, 4,394,472, Cl. 524-100.000.
Yasuta, Naoshi; Matsumura, Yoshio; and Kotani, Teizo, 4,394,402, Cl. 427-40.000.
Jefferies, Steven R. Bone graft material for osseous defects and method of making same. 4,394,370, Cl. 424-15.000.
Jeffras, Nathaniel B.; and Torgersen, Robert H., to Automation Industries, Inc. Sonic water jet nozzle. 4,393,991, Cl. 239-102.000.
Jenkner, Herbert; Strang, Robert; and Adermann, Peter, to Chemische Fabrik Kalk GmbH. Polypentabromostyrene, process for the production and use. 4,394,484, Cl. 525-72.000.
Jensen, Bernard: *See*—
McMahon, William; and Jensen, Bernard, 4,394,074, Cl. 351-206.000.
John Wyeth and Brother Limited: *See*—
Crossley, Roger, 4,394,509, Cl. 546-339.000.
Johnson, David G.: *See*—
Crummer, Marvin R.; Gold, Kenneth S.; Johnson, David G.; Vandermeyden, Tom R.; and Pelta, Edmond R., 4,394,742, Cl. 364-487.000.
Johnson, Gordon C.: *See*—
Weinberg, Kurt; and Johnson, Gordon C., 4,394,295, Cl. 252-431.00C.
Johnson, Marvin M.: *See*—
Kukes, Semyon; Nowack, Gerhard P.; and Johnson, Marvin M., 4,394,255, Cl. 585-667.000.
Nowack, Gerhard P.; Johnson, Marvin M.; and Tabler, Donald C., 4,394,298, Cl. 252-438.000.
Johnson Matthey Public Limited Company: *See*—
Hydes, Paul C.; and Hepburn, Derek R., 4,394,319, Cl. 260-429.00R.
Johnson, Thomas A.: *See*—
Ford, Michael E.; and Johnson, Thomas A., 4,394,524, Cl. 564-479.000.
Johnson, Timothy L.: *See*—
Bukowski, Ronald G.; and Johnson, Timothy L., 4,394,262, Cl. 210-103.000.
Johnston, Daniel U.; and Shinkle, George A., to General Motors Corporation. Piezoelectric knock sensor. 4,393,688, Cl. 73-35.000.
Jolly, Frank H. Rotary engine. 4,393,828, Cl. 123-203.000.
Jones, Carolyn R. Disposable garment shield and method of manufacture. 4,393,521, Cl. 2-56.000.
Jones, Raymond D., to TII Corporation. Surge arrester assembly. 4,394,704, Cl. 361-119.000.
Josendal, Virgil A., to Union Oil Company of California. Method for the enhanced recovery of oil and natural gas. 4,393,936, Cl. 166-263.000.
Joyce, Ronald S., to Calgon Carbon Corporation. Silver removal with halogen impregnated activated carbon. 4,394,354, Cl. 423-25.000.
Jozuka, Masao: *See*—
Asano, Kiyomitsu; Jozuka, Masao; and Kondo, Toshikatsu, 4,394,093, Cl. 400-124.000.
Ju, Kochan: *See*—
Hirko, Richard G.; Ju, Kochan; and Sanders, Ian L., 4,394,746, Cl. 365-36.000.
Jurisson, Jaan, to Honeywell Inc. Optically enhanced Schottky barrier IR detector. 4,394,571, Cl. 250-216.000.
Juzhnoe Proizvodstvennoe Obiedinenie Po Morskim Geologorazvedochnym Rabotam "JUZHMORGEOLOGIA": *See*—
Maiko, Viktor P., 4,394,618, Cl. 324-83.00D.
Kabel-und Metallwerke Gutehoffnungshutte AG: *See*—
Uhlmann, Otto; and Uhlmann, Klaus-Peter, 4,393,566, Cl. 29-417.000.
Kabik, Irving; and Ringbloom, Vernon D., to United States of America, Navy. Cook-off resistant booster explosive. 4,394,197, Cl. 149-19.300.
Kabushiki Kaisha Daini Seikosha: *See*—
Shimbo, Masafumi, 4,393,574, Cl. 29-571.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Asami, Takayoshi; and Sonoi, Hidekazu, 4,393,924, Cl. 165-104.120.
Kaneko, Koji; Fuchino, Yoshihide; and Inoue, Tsuyoshi, 4,394,169, Cl. 75-128.00A.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Furukawa, Hideo; Chikugo, Kazuo; and Otsuki, Yoichi, 4,393,823, Cl. 123-196.00M.
Hirosawa, Katsu, 4,393,607, Cl. 37-103.000.
Kabushiki Kaisha Meidensha: *See*—
Warabi, Junichi; Sakuma, Shinzo; Kawaguchi, Hidemi; and Kobari, Yukio, 4,394,554, Cl. 200-144.00B.
Kabushiki Kaisha Riken: *See*—
Wada, Masahiko; and Ueki, Masato, 4,393,981, Cl. 221-289.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Morozumi, Shinji, 4,394,586, Cl. 377-105.000.
Kabushiki Kaisha Togo Seisakusho: *See*—
Kato, Yoshinori, 4,393,560, Cl. 24-295.000.
Kaeding, Warren W.: *See*—
Chu, Chin C.; and Kaeding, Warren W., 4,394,300, Cl. 252-455.00Z.
Kaenniemi, Kaarina M. E.: *See*—
Makinen, Juho K.; and Kaenniemi, Kaarina M. E., 4,394,164, Cl. 75-21.000.

Kahn, Alan R., to Meadox Instruments, Inc. Pressure monitoring method and apparatus. 4,393,878, Cl. 128-748.000.
Kaiser, Kenneth L.; and Shirley, William C. Panel edge gasket with compressible sealing portion. 4,394,026, Cl. 277-231.000.
Kaizuka, Takanoli: *See*—
Suzuki, Yoshihisa; Kaizuka, Takanoli; Hanyu, Yoshiaki; Otake, Mituyoshi; and Hidano, Yoichi, 4,394,404, Cl. 427-48.000.
Kaken Chemical Co., Ltd.: *See*—
Aoki, Yoshio, 4,394,144, Cl. 55-281.000.
Kakihara, Yoshinobu: *See*—
Takeda, Mikio; Kakihara, Yoshinobu; Yoshida, Masaru; and Nakata, Yukihiko, 4,394,601, Cl. 313-509.000.
Kakinuma, Toshihide: *See*—
Makabe, Hachiro; Watanabe, Kazuo; Takenoya, Hideaki; Kume, Toshiaki; and Kakinuma, Toshihide, 4,393,795, Cl. 112-158.00E.
Kalopissis, Gregoire, to Societe Anonyme dite: L'Oreal. 5-Ureido-3-thia hexanedioic acid. 4,394,520, Cl. 562-557.000.
Kamachi, Hajime; Okumura, Jun; Naito, Takayuki; and Oka, Masahisa, to Bristol-Myers Company. Cephalosporin derivatives. 4,394,503, Cl. 544-25.000.
Kamata, Susumu; and Nagata, Wataru, to Shionogi & Co., Ltd. 5-Fluorouracil derivatives. 4,394,505, Cl. 544-91.000.
Kamemura, Yoshiki: *See*—
Tamura, Manabu; Kamemura, Yoshiki; and Handa, Masao, 4,393,677, Cl. 72-97.000.
Kamimae, Hiroshi; and Ishikawa, Tadashi, to Nihon Nosan Kogyo K.K. Method for preventing hypertriglyceridemia. 4,394,376, Cl. 424-150.000.
Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, to Matsushita Electric Industrial Co., Ltd. Thin-film magnetic head. 4,394,699, Cl. 360-113.000.
Kaminski, Joan M.: *See*—
Horodysky, Andrew G.; and Kaminski, Joan M., 4,394,278, Cl. 252-46.300.
Kammerlander, Karl, to Siemens Aktiengesellschaft. Process for monitoring analog and digital mobile radio connections. 4,394,760, Cl. 370-111.000.
Kamyr, Inc.: *See*—
Richter, Johan C. F. C.; and Richter, Ole J., 4,394,267, Cl. 210-331.000.
Kanai, Kenji: *See*—
Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, 4,394,699, Cl. 360-113.000.
Kaneko, Koji; Fuchino, Yoshihide; and Inoue, Tsuyoshi, to Kabushiki Kaisha Kobe Seiko Sho. High strength austenite steel having excellent cold work hardenability. 4,394,169, Cl. 75-128.00A.
Kaneko, Toshihisa, to Dai Nippon Insatsu Kabushiki Kaisha. Device for washing blanket cylinder of rotary offset press. 4,393,778, Cl. 101-425.000.
Kanno, Yoshimitsu: *See*—
Yoshida, Kunio; Kotera, Hiroaki; Tsuda, Yukifumi; Kanno, Yoshimitsu; and Naka, Motohiko, 4,394,662, Cl. 346-33.00R.
Kansai Electric Power Co., Inc., The: *See*—
Shima, Michitsune; Kihara, Shiso; Omichi, Takeo; Igarashi, Taenji; and Mangetsu, Kenji, 4,393,920, Cl. 165-11.00A.
Kansas State University Research Foundation: *See*—
Suderman, Donald A., 4,393,791, Cl. 111-34.000.
Karagoz, Berch Y., to Great Lakes Carbon Corporation. Graphitization system method and apparatus. 4,394,766, Cl. 373-120.000.
Karl Mengele & Sohne Maschinenfabrik und Eissengiesserei GmbH & Co.: *See*—
Frick, Georg; Reiff, Harro; and Kirsch, Alois, 4,393,570, Cl. 29-560.000.
Karl Schmidt GMBH: *See*—
Bickle, Wolfgang; Funke, Rolf; and Pfoh, Rolf, 4,394,275, Cl. 252-12.000.
Karlicek, Robert F., Jr.: *See*—
Donnelly, Vincent M.; Flamm, Daniel L.; and Karlicek, Robert F., Jr., 4,394,237, Cl. 204-192.00E.
Karreman, Jacob: *See*—
Acda, Petrus M.; and Karreman, Jacob, 4,394,343, Cl. 264-296.000.
Kashihara, Toshitsugu: *See*—
Yoshino, Tsunemi; Kashihara, Toshitsugu; Iwata, Hiroshi; and Morioka, Akitoshi, 4,394,077, Cl. 354-25.000.
Kasper, George P., to Eastman Kodak Company. Electrographic development apparatus and method having oscillating magnetic cross-mixing. 4,393,810, Cl. 118-657.000.
Kasprzyk, Donald J., to Honeywell Inc. Electronic thermostat with protected circuitry. 4,394,708, Cl. 361-399.000.
Kastelic, John R., to Celanese Corporation. Method for providing particulates of liquid crystal polymers and particulates produced therefrom. 4,394,498, Cl. 528-193.000.
Kasugai, Syouji: *See*—
Kato, Masahisa; Kasugai, Syouji; and Gouda, Osamu, 4,393,801, Cl. 112-282.000.
Kataoka, Ryuji, to Fuji Jukogyo Kabushiki Kaisha; and Nissan Motor Co., Ltd. System for controlling an air-fuel ratio. 4,393,839, Cl. 123-440.000.
Kato, Hiroshi; Ato, Hisataka; Inagaki, Osamu; and Matsuo, Hiroshi, to Amano Corporation. Time recorder. 4,394,666, Cl. 346-82.000.
Kato, Kotaro; and Sakurai, Tetsuma, to Nippon Telegraph & Telephone Public Corporation. Method of manufacturing semiconductor device provided with complementary semiconductor elements. 4,393,573, Cl. 29-571.000.
Kato, Masahisa; Kasugai, Syouji; and Gouda, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Sewing machine dust collector. 4,393,801, Cl. 112-282.000.
Kato, Toshiro: *See*—
Kirino, Osamu; Hirano, Masachika; Takeda, Hisami; and Kato, Toshiro, 4,394,379, Cl. 424-211.00Y.
Kato, Yoshinori, to Kabushiki Kaisha Togo Seisakusho. Clip for retaining a windshield molding in an automobile. 4,393,560, Cl. 24-295.000.
Kaufman, Gilbert T.; and Evans, Alfred, to Critter Getter, Inc. Trap apparatus, and methods of fabricating and utilizing same. 4,393,616, Cl. 43-60.000.
Kaufman, Lance R. Power switching device having improved heat dissipation means. 4,394,530, Cl. 174-16.0HS.
Kawaguchi, Hidemi: *See*—
Warabi, Junichi; Sakuma, Shinzo; Kawaguchi, Hidemi; and Kobari, Yukio, 4,394,554, Cl. 200-144.00B.
Kawaguchi, Hideo; Inayama, Takayuki; Takimoto, Masaaki; and Ono, Yoshihiro, to Fuji Photo Film Co., Ltd. Photographic sensitive materials. 4,394,441, Cl. 430-524.000.
Kawai, Hisasi: *See*—
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,393,702, Cl. 73-204.000.
Kawai, Kiyoshi: *See*—
Yamada, Yasuharu; and Kawai, Kiyoshi, 4,394,292, Cl. 252-429.00R.
Kawamura, Kiyoshi: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,394,382, Cl. 424-283.000.
Kawata, Mitsuyasu; Umetsu, Noriharu; and Fukuto, Tetsuo R., to University of California, Regents of the. N-Alkoxysulfenylcarbamates useful as insecticides. 4,394,383, Cl. 424-285.000.
Kawauchi, Yuji: *See*—
Satoh, Shingo; Inoue, Takashi; Naki, Minoru; and Kawauchi, Yuji, 4,394,165, Cl. 75-60.000.
Kaye, Wilbur I., to Beckman Instruments, Inc. Liquid crystal tuned birefringent filter. 4,394,069, Cl. 350-347.00E.
Keil, Reinhart: *See*—
Janicki, Max; Liefke, Hans-Georg; Keil, Reinhart; and Geyer, Gerd, 4,394,609, Cl. 318-603.000.
Keiper, Francis P., Jr.; and Kerns, John N., to Lear Siegler, Inc. Telephone line holding circuit. 4,394,543, Cl. 179-84.00R.
Kellar, David E.: *See*—
Barter, James A.; and Kellar, David E., 4,394,328, Cl. 260-463.000.
Kelley, Clarence R., to C. C. Kelley & Sons. Two hole hydraulic cushion valve. 4,393,751, Cl. 91-408.000.
Kemper, Yves J., to Ipanema Company. Hybrid power system and method for operating same. 4,393,964, Cl. 192-.044.
Kenan, Richard P.: *See*—
Verber, Carl M.; Kenan, Richard P.; and Ridgway, Richard, 4,394,060, Cl. 350-96.130.
Kendall Company, The: *See*—
Taylor, Glenn N., 4,393,880, Cl. 128-760.000.
Kennedy, James A., to William L. Bonnell Company, The. Scrap metal recovery process. 4,394,166, Cl. 75-65.00R.
Kenyon, S. Wayne; Geyer, Bernard H., Jr.; and Nelson, Conrad E., to General Electric Company. Compensated directional coupler. 4,394,630, Cl. 333-116.000.
Keogh, Michael J., to Union Carbide Corporation. Compositions of alkylene-alkyl acrylate copolymers having improved flame retardant properties. 4,394,471, Cl. 524-92.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Divisek, Jiri; and Mergel, Jurgen, 4,394,244, Cl. 204-295.000.
Golimowski, Jerzy; Sipos, Laszlo; and Valenta, Paul, 4,394,238, Cl. 204-400.000.
Kernforschungszentrum Karlsruhe GmbH: *See*—
Schmidt, Curt, 4,393,714, Cl. 73-718.000.
Kerns, John N.: *See*—
Keiper, Francis P., Jr.; and Kerns, John N., 4,394,543, Cl. 179-84.00R.
Kerry, John C.: *See*—
Copping, Leonard G.; Kerry, John C.; Watkins, Thomas I.; Willis, Robert J.; and Palmer, Bryan H., 4,394,387, Cl. 424-300.000.
Kessler, Milton; and Ullman, Myron E., Jr., to Kessler Products Co., Inc. Reusable container closure cap. 4,393,978, Cl. 215-253.000.
Kessler Products Co., Inc.: *See*—
Kessler, Milton; and Ullman, Myron E., Jr., 4,393,978, Cl. 215-253.000.
Keyes, Richard M.; and Schwitters, Stephen W., to Taylor Freezer Company. Method and apparatus for producing sterile slush ice. 4,393,659, Cl. 62-66.000.
Keyser, William L.; and Kinney, Diane S., to Quaker Oats Company, The. Low calorie table syrup product. 4,394,399, Cl. 426-658.000.
Kihara, Shiso: *See*—
Shima, Michitsune; Kihara, Shiso; Omichi, Takeo; Igarashi, Taenji; and Mangetsu, Kenji, 4,393,920, Cl. 165-11.00A.
Kille, Ewald; and Zimmermann, Guido, to J. Wagner GmbH. Spray gun. 4,393,993, Cl. 239-332.000.
Kim, Chan J.; and Koski, Ahti A., to Polysar Limited. Zinc peroxide process. 4,394,488, Cl. 524-432.000.
Kimerling, Lionel C.: *See*—
Jackson, Kenneth A.; and Kimerling, Lionel C., 4,394,183, Cl. 148-1.500.

Kimura, Hirovuki; and Yamada, Tateo, to Canon Kabushiki Kaisha. Winding device for camera. 4,394,080, Cl. 354-173.000.

Kimura, Koichi: *See*—
Sugitani, Hiroshi; Matsuda, Hiroto; Kimura, Koichi; and Ikeda, Masami, 4,394,670, Cl. 346-140.00R.

Kimura, Tadatomo; and Noguchi, Takeshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Three-phase induction motor. 4,394,596, Cl. 310-184.000.

King, John M.: *See*—
deVries, Louis; and King, John M., 4,394,279, Cl. 252-46.400.

King, Pay-Shin: *See*—
Iida, Hitoshi; and King, Pay-Shin, 4,394,688, Cl. 358-160.000.

Kinney, Diane S.: *See*—
Keyser, William L.; and Kinney, Diane S., 4,394,399, Cl. 426-658.000.

Kirby, Donald W.: *See*—
Fallon, William H.; Schober, William R.; Neukirch, Edward O.; and Kirby, Donald W., 4,394,611, Cl. 320-21.000.

Kirino, Osamu; Hirano, Masachika; Takeda, Hisami; and Kato, Toshiro, to Sumitomo Chemical Company, Limited. Amide phosphorothiolate derivatives and their use as pesticides. 4,394,379, Cl. 424-211.000.

Kirsch, Alois: *See*—
Frick, Georg; Reiff, Harro; and Kirsch, Alois, 4,393,570, Cl. 29-560.000.

Kishi, Kenichi: *See*—
Ishii, Fumio; and Kishi, Kenichi, 4,394,315, Cl. 260-396.00R.

Kishi, Norimasa: *See*—
Suzuki, Tadashi; and Kishi, Norimasa, 4,393,732, Cl. 74-866.000.

Kishida, Katsuhiro; Mekuchi, Yutaka; Hirao, Sumio; and Date, Hirohiko, to Nissan Motor Company, Ltd. Covered electrode containing zirconium for shielded metal arc welding. 4,394,560, Cl. 219-137.0WM.

Kishie, Hidehiko: *See*—
Yamamoto, Hideomi; Watanabe, Haruzo; Kishie, Hidehiko; and Nishihara, Toshio, 4,394,412, Cl. 428-174.000.

Kiss, Gunter H., to Lignotock Verfahrenstechnik GmbH. Process and apparatus for deburring moulded parts produced by pressing. 4,394,334, Cl. 264-80.000.

Kistner, Herbert: *See*—
Sell, Rudolf; and Kistner, Herbert, 4,393,638, Cl. 52-704.000.

Kitamura, Yohji. Snail wire arrangement for yarn breakage detection in ring frames. 4,393,647, Cl. 57-81.000.

Kitoh, Shinya: *See*—
Miyake, Mikio; Kitoh, Shinya; and Hayashi, Satoshi, 4,394,494, Cl. 526-301.000.

Kitzelmann, Dieter; and Deprez, Jacques, to Bayer Aktiengesellschaft. Electro-chemical sensor for the detection of reducing gases, in particular carbon monoxide, hydrazine and hydrogen in air. 4,394,239, Cl. 204-414.000.

Kiwi, John: *See*—
Gratzel, Michael; and Kiwi, John, 4,394,293, Cl. 252-430.000.

Klein, Gerald I., to Westinghouse Electric Corp. Microstrip circuit with suspended substrate stripline regions embedded therein. 4,394,633, Cl. 333-238.000.

Klein, Max, to Crane & Co., Inc., a part interest. Filter apparatus. 4,394,146, Cl. 55-354.000.

Klein, Paul E. Adhesive-backed booklet for credit card transaction. 4,394,038, Cl. 282-1.00R.

Klein, Stewart E. 3-(Trimethoxysilyl) propyldidecylmethyl ammonium salts and method of inhibiting growth of microorganisms therewith. 4,394,378, Cl. 424-184.000.

Kleiner, Fredric; and Zemelman, Valery B., to General Foods Corporation. Quiescent formation of gasified ice product and process. 4,393,660, Cl. 62-69.000.

Kleynjan, Cornelis: *See*—
Jager, Berend; Brink, Andries; and Kleynjan, Cornelis, 4,394,215, Cl. 196-14.520.

Klockner-Humboldt-Deutz AG: *See*—
Fischer, Friedrich B.; and Moser, Gottfried, 4,393,824, Cl. 123-196.0AB.
Heintges, Siegfried; Strauss, Werner; and Weiffen, Karl-Heinz, 4,394,260, Cl. 209-500.000.

Klomp, Edward D., to General Motors Corporation. Air bearing and antifriction bearing assembly. 4,394,091, Cl. 384-101.000.

Kloosterman, William A. Spring shielded safety knife. 4,393,587, Cl. 30-162.000.

Klopfenstein, King L.; and Connors, Robert H., to Triangle Package Machinery Company. Tare weighing apparatus and method therefor. 4,393,950, Cl. 177-108.000.

Klotz, Erhard: *See*—
Weiss, Hermann; Klotz, Erhard; Peemoller, Horst; Linde, Rolf; and Mauser, Wilfried, 4,394,063, Cl. 350-162.130.

Knell, Franz-Georg: *See*—
Reimpell, Uwe; Grof, Helmut; Knell, Franz-Georg; and Wamser, Anton, 4,394,765, Cl. 373-52.000.

Knigge, Robert A.: *See*—
Allen, James R.; Allen, John D.; and Knigge, Robert A., 4,394,004, Cl. 254-204.000.

Knosky, Ronald J. Projectile lubricating and muzzle loading device for gun. 4,393,613, Cl. 42-90.000.

Knox, Arnold W., deceased (by Knox, Ester, executrix), to Crane Carrier Corporation. Actuation means for the racking platform of a mast. 4,393,630, Cl. 52-121.000.

Knox, Ester, executrix: *See*—
Knox, Arnold W., deceased, 4,393,630, Cl. 52-121.000.

Knutson, Clarence A., Jr.: *See*—
Cadmus, Martin C.; and Knutson, Clarence A., Jr., 4,394,447, Cl. 435-104.000.

Kobari, Yukio: *See*—
Warabi, Junichi; Sakuma, Shinzo; Kawaguchi, Hidemi; and Kobari, Yukio, 4,394,554, Cl. 200-144.00B.

Kobayashi, Hisao: *See*—
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, 4,393,966, Cl. 192-56.00R.

Kobayashi, Katsumi, to Sony Corporation. Variable aspect ratio television receiver. 4,394,690, Cl. 358-180.000.

Kobayashi, Masaaki: *See*—
Igata, Kouichi; and Kobayashi, Masaaki, 4,394,701, Cl. 360-137.000.

Kobelt, Jacob. Self-centering device for caliper brake assembly, 4,393,962, Cl. 188-72.600.

Kock, Coral A. Elbow pillow. 4,393,520, Cl. 2-16.000.

Kodama, Kenji: *See*—
Fukushima, Hatahiko; Handa, Tadahiko; and Kodama, Kenji, 4,394,333, Cl. 264-37.000.

Koehne, Hermann D. Rail vehicle for track investigation. 4,393,691, Cl. 73-84.000.

Koeniger, Arthur F.: *See*—
Bresser, Robert E.; White, Sidney S., Jr.; and Koeniger, Arthur F., 4,394,325, Cl. 260-446.000.

Kohama, Tokio; Obayashi, Hideki; Kawai, Hisai; and Egami, Tsuneyuki, to Nippon Soken, Inc. Gas flow measuring device. 4,393,702, Cl. 73-204.000.

Kohl, Wayne H., to United States of America, National Aeronautics and Space Administration. Distributed multiport memory architecture. 4,394,726, Cl. 364-200.000.

Kohler, Richard P. J.: *See*—
Mahoon, Alauddin; and Kohler, Richard P. J., 4,394,224, Cl. 204-57.000.

Kokiso, Masakazu: *See*—
Tarumi, Noriyoshi; Tsuchiya, Hiroshi; Kokiso, Masakazu; and Ohta, Hiroaki, 4,394,340, Cl. 264-219.000.

Kolb, Dieter, to Christian Majer GmbH & Co. KG. Arrangement for affixing the bottom of a thermoplastic container. 4,394,209, Cl. 156-580.100.

Kolenik, Steve: *See*—
Imran, Mir; and Kolenik, Steve, 4,393,877, Cl. 128-705.000.

Kolts, John H., to Phillips Petroleum Company. Zinc titanate catalyst. 4,394,297, Cl. 252-437.000.

Komaki, Takao; and Matsumoto, Seiji, to Fuji Photo Film Co., Ltd. Method of processing radiographic image. 4,394,737, Cl. 364-414.000.

Komatsu, Shigeru; and Nakamura, Michio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for fabricating semiconductor device by heat treatment of insulating film to improve adhesion to a resist film. 4,394,436, Cl. 430-311.000.

Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH: *See*—
Eckle, Otto; and Veigel, Helmut, 4,393,735, Cl. 82-36.00R.

Komori Printing Machinery Co., Ltd.: *See*—
Toyoda, Hideaki, 4,393,776, Cl. 101-365.000.

Komorizono, Junichi, to Aisin Seiki Kabushiki Kaisha. Reservoir for a master cylinder. 4,393,655, Cl. 60-585.000.

Kondo, Kenshi, to Nihon Den-Nitsu Keiki Co., Ltd. Heat-controlled sanitary bathing device. 4,393,525, Cl. 4-420.200.

Kondo, Toshikatsu: *See*—
Asano, Kiyomitsu; Jozuka, Masao; and Kondo, Toshikatsu, 4,394,093, Cl. 400-124.000.

Konicek, Jiri K., to Oak Industries Inc. Printed circuit material. 4,394,419, Cl. 428-416.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Ishii, Fumio; and Kishi, Kenichi, 4,394,315, Cl. 260-396.00R.
Tarumi, Noriyoshi; Tsuchiya, Hiroshi; Kokiso, Masakazu; and Ohta, Hiroaki, 4,394,340, Cl. 264-219.000.

Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, to Toyoda Jidosha Kogyo Kabushiki Kaisha; and Nippon Denso Company Limited. Operation control apparatus of a compressor. 4,393,966, Cl. 192-56.00R.

Kopp, Gerald F., to Honeywell Inc. Electrical contact for conductive-backed paper. 4,394,665, Cl. 346-76.00R.

Koppers Company, Inc.: *See*—
Leston, Gerd, 4,394,526, Cl. 568-716.000.

Korach, Malcolm, to PPG Industries, Inc. Cathode element for solid polymer electrolyte. 4,394,229, Cl. 204-98.000.

Korea Advanced Institute of Science and Technology: *See*—
Han, Moon H.; and Seong, Baik L., 4,394,312, Cl. 260-239.30P.
Park, Sang-Woo, 4,394,233, Cl. 204-158.0HA.

Korry Manufacturing Co.: *See*—
Schlosser, Mark S., 4,394,552, Cl. 200-61.620.

Koski, Ahti A.: *See*—
Kim, Chan J.; and Koski, Ahti A., 4,394,488, Cl. 524-432.000.

Kost, Erwin: *See*—
Folta, Werner; and Kost, Erwin, 4,393,683, Cl. 72-422.000.

Kotani, Teizo: *See*—
Yasuta, Naoshi; Matsumura, Yoshio; and Kotani, Teizo, 4,394,402, Cl. 427-40.000.

Kotera, Hiroaki: *See*—
Yoshida, Kunio; Kotera, Hiroaki; Tsuda, Yukifumi; Kamo, Yoshimitsu; and Naka, Motohiko, 4,394,662, Cl. 346-33.00R.

Kotera, Noboru: *See*—
Takahashi, Kenji; Yamazaki, Hisashi; Miyahara, Junji; Kotera, Noboru; Eguchi, Shusaku; and Miura, Norio, 4,394,581, Cl. 250-484.100.

Kovacs, Daniel C., to SMS Schloemann-Siemag, Inc. Method for rolling rails. 4,393,680, Cl. 72-234.000.

Kowa Company, Ltd.: *See—*
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,394,382, Cl. 424-283.000.

Kowalski, Eugene, to Elpo Industries, Inc. Food mincer. 4,393,588, Cl. 30-196.000.

Koyama, Hideaki: *See—*
Tachihara, Jin; and Koyama, Hideaki, 4,394,557, Cl. 219-10.55B.

Koyama, Kazuo: *See—*
Furukawa, Takashi; and Koyama, Kazuo, 4,394,186, Cl. 148-12.00F.

Krahe, Mark R.: *See—*
Marzka, Richard, 4,394,040, Cl. 294-66.00R.

Kreisal, Ottmar; Schurrer, Josef; Motz, Karl; Leitgeb, Wilhelm; and Rosenberg, Heinz, to M.A.N.-Dachauer; and Siemens. Method and apparatus for utilizing the waste heat energy of an internal combustion engine. 4,394,582, Cl. 290-4.00C.

Krent, Edward D. Three-dimensional acoustic ceiling tile system for dispersing long wave sound. 4,393,631, Cl. 52-144.000.

Kroder, Claus: *See—*
Gebhard, Werner; and Kroder, Claus, 4,393,718, Cl. 73-859.000.

Kronos Titan-G.m.b.H.: *See—*
Hartmann, Achim; and Schinkitz, Dieter, 4,394,270, Cl. 210-726.000.

Kronstadt, Victor, to Mack Trucks, Inc. Clutch assist apparatus. 4,393,907, Cl. 192-99.00S.

Krueger, Hans: *See—*
Pape, Heinz; Quella, Ferdinand; and Krueger, Hans, 4,394,068, Cl. 350-345.000.

Krull, Manfred; Lobert, Udo; Stamm, Dieter; and Veeser, Klaus, to Carl Freudenberg, Firma. Structural panel of gypsum with textile casing and method for producing same. 4,394,411, Cl. 428-70.000.

Kruse, Lawrence I., to SmithKline Beckman Corporation. Processes for preparing 4-substituted indoles. 4,394,514, Cl. 548-508.000.

Kubis, Charles S.: *See—*
Walter, John; Roth, Donald J.; and Kubis, Charles S., 4,394,408, Cl. 427-231.000.

Kuckens, Alexander, to Dagma Deutsche Automaten und Getrankemaschinen GmbH & Co. KG. Metered dispensing of liquids. 4,393,982, Cl. 222-209.000.

Kuehnle, Manfred R., to Coulter Systems Corporation. Low-profile electrophotographic copying machine. 4,394,084, Cl. 355-3.0BE.

Kuenzig, Ernest O.; and Pennino, Frank L. Mandrel adjustment system in a plastic resin blow molding machine. 4,394,116, Cl. 425-192.00R.

Kuhn, Joseph B.: *See—*
McClelland, Henry T.; and Kuhn, Joseph B., 4,394,185, Cl. 148-11.50C.

Kuhns, Walter: *See—*
Stage, Hermann; Hammer, Hartmut; and Kuhns, Walter, 4,394,221, Cl. 203-89.000.

Kuibers-Kiewik, Walfrida G. E.; Akkerman, Johannes; and Gons, Johan, to Wavin B.V. Composition for preventing plate out in extrusion equipment. 4,394,501, Cl. 528-485.000.

Kukes, Semyon; Nowack, Gerhard P.; and Johnson, Marvin M., to Phillips Petroleum Company. Isomerization process. 4,394,255, Cl. 585-667.000.

Kukolja, Stjepan; and Pfeil, Janice L., to Eli Lilly and Company. Symmetrical azetidinone aldehyde disulfides and process. 4,394,313, Cl. 260-245.400.

Kumano, Fumihiro: *See—*
Hamashima, Tetsuo; and Kumano, Fumihiro, 4,393,586, Cl. 30-43.600.

Kumar, Mahesh; Menna, Raymond J.; and Huang, Ho-Chung, to RCA Corporation. Hybrid power divider/combiner circuit. 4,394,629, Cl. 333-109.000.

Kume, Toshiaki: *See—*
Makabe, Hachiro; Watanabe, Kazuo; Takenoya, Hideaki; Kume, Toshiaki; and Kakinuma, Toshihide, 4,393,795, Cl. 112-158.00E.

Kummermehr, Hans, to Grunzweig & Hartmann und Glasfaser AG. Thermal insulating body and a process for making the same. 4,394,337, Cl. 264-122.000.

Kunieda, Hisashi: *See—*
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,394,382, Cl. 424-283.000.

Kuntz, David H. Spark-generating roller skate assembly. 4,394,037, Cl. 280-816.000.

Kunz, Paul. Adjustable brush. 4,393,535, Cl. 15-169.000.

Kuper, Douglas D.: *See—*
Menezes, William A.; and Kuper, Douglas D., 4,394,745, Cl. 364-900.000.

Kurihara, Hiroshi; Takenaka, Sadao; and Itaya, Eiji, to Fujitsu Limited. Phase synchronizing circuit. 4,394,626, Cl. 331-12.000.

Kurland, Marvin: *See—*
Dunn, William H.; Horey, Leonard I.; and Kurland, Marvin, 4,393,796, Cl. 112-158.00E.

Kurnit, Norman A. Ring cavity for a raman capillary waveguide amplifier. 4,394,623, Cl. 330-4.300.

Kurosawa, Tsutomu, to Sahi Electronics Co., Ltd. Magnetic recording-/reproducing apparatus. 4,394,697, Cl. 360-91.000.

Kurtz, Thomas D. Metal mirror mounting clip. 4,394,000, Cl. 248-466.000.

Kusaba, Yoshiaki, to Sumitomo Metal Industries, Ltd. Method for producing blank for wide flange beam. 4,393,679, Cl. 72-221.000.

Kushigian, Anthony. Thread grinder. 4,393,624, Cl. 51-5.00D.

Kutsuzawa, Masaki: *See—*
Wakamiya, Yoshinori; Hamasaki, Yoshiharu; Kutsuzawa, Masaki; and Mitsubishi Denki Kabushiki Kaisha, 4,394,121, Cl. 432-11.000.

Kuwahara, Kenshi, to Mitsui Aluminum Co., Ltd. Method of carbothermically producing aluminum. 4,394,167, Cl. 75-68.00A.

Kwakernaak, Adriaan: *See—*
Exalto, Robertus; and Kwakernaak, Adriaan, 4,394,232, Cl. 204-144.000.

Kyotani, Yoshinori: *See—*
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,394,382, Cl. 424-283.000.

Kyushu Electric Power Co., Inc.: *See—*
Shima, Michitsune; Kihara, Shiso; Omichi, Takeo; Igarashi, Taenji; and Mangetsu, Kenji, 4,393,920, Cl. 165-11.00A.

L.C.E. Ltd.: *See—*
Gielisse, Peter J., 4,394,580, Cl. 250-461.100.

Laboratory Equipment Corp.: *See—*
Marshall, Richard A.; and Miller, Edward F., 4,393,695, Cl. 73-117.300.

Lachmann, Ulrich: *See—*
Ertl, Wilhelm; Lachmann, Ulrich; and Pertsch, Heinrich, 4,394,190, Cl. 148-31.550.

La Franca, Peter J. X-Ray film package and method and apparatus for making the same. 4,394,770, Cl. 378-169.000.

Laitram Corporation, The: *See—*
Lapeyre, James M.; Svendsen, Noel A.; Carroll, Raymond J., Jr.; Long, Henry H.; and Lindberg, Richard S., 4,393,544, Cl. 17-73.000.
Lapeyre, James M., 4,394,664, Cl. 346-76.00R.

LaLonde, Gary R.: *See—*
Goetz, George W.; Santti, Arne J.; and LaLonde, Gary R., 4,394,033, Cl. 280-736.000.

Lamanna, Peter J.: *See—*
Humble, David R.; Weaver, Jon N.; Gentzler, David L.; Eskandry, Ezra D.; and Lamanna, Peter J., 4,394,645, Cl. 340-572.000.

Lambert, Jacques. Napkin for a young child. 4,393,865, Cl. 128-80.00A.

Lampelzammer, Helga: *See—*
Huber, Peter; August, Peter; Lampelzammer, Helga; and Primas, Willi, 4,394,518, Cl. 556-424.000.

Lamport, Daphne L.: *See—*
Smith, James; and Lamport, Daphne L., 4,394,599, Cl. 313-422.000.

Landon, Alfred J.; Pennebaker, William B.; and Wang, Han C., to International Business Machines Corporation. Electrostatic clutch-operated printing mechanism. 4,393,769, Cl. 101-93.300.

Landon, Alfred J.: *See—*
Cuomo, Jerome J.; Landon, Alfred J.; and Wang, Han C., 4,393,967, Cl. 192-84.00E.

Lane, Ronald S.; and Wittes, James M., to Lane, Ronald S. Perpetual calendar. 4,393,611, Cl. 40-107.000.

Langer, Heimo J.: *See—*
Gruber, Bruce A.; Langer, Heimo J.; and Dunnavant, William R., 4,394,466, Cl. 523-141.000.

Lapeyre, James M.; Svendsen, Noel A.; Carroll, Raymond J., Jr.; Long, Henry H.; and Lindberg, Richard S., to Laitram Corporation, The. Krill peeling machine. 4,393,544, Cl. 17-73.000.

Lapeyre, James M., to Laitram Corporation, The. Thermal plotter. 4,394,664, Cl. 346-76.00R.

Lapides, Melvin E., to Electric Power Research Institute, Inc. Apparatus and method for ultrasonic detection of flaws in power plant piping systems. 4,393,711, Cl. 73-592.000.

Larsen, James E.; and Rogers, Charles E., to Randall Industries, Inc. Apparatus for basketball. 4,394,013, Cl. 273-1.50R.

Larsen, Thomas E.: *See—*
Nygard, James C.; Weiss, Melvin P.; and Larsen, Thomas E., 4,393,804, Cl. 118-60.000.

Larson, Ove; and Davidson, Charles, to Robotgruppen HB. Flexible arm, particularly a robot arm. 4,393,728, Cl. 74-469.000.

Larson, Willis A., to Oak Industries, Inc. Laminated membrane switch. 4,394,547, Cl. 200-5.00A.

Laurel Enterprises: *See—*
Frankel, Charles, 4,393,552, Cl. 24-213.00C.

Lawson-Hemphill, Inc.: *See—*
Lawson, John B., 4,393,701, Cl. 73-160.000.

Lawson, Jimmie B.; and Richardson, Edwin A., to Shell Oil Company. Treating wells with ion-exchange-precipitated scale inhibitor. 4,393,938, Cl. 166-279.000.

Lawson, John B., to Lawson-Hemphill, Inc. Yarn tester system. 4,393,701, Cl. 73-160.000.

Layher, Eberhard. Scaffolding structure. 4,394,095, Cl. 403-49.000.

Lazarre, Flavien, to Societe Nationale Elf Aquitaine (Production). Process and device for dispersing flammable gases into the atmosphere. 4,393,990, Cl. 239-1.000.

Leach, Clifford, Sr. Manual knitting frame with support. 4,393,668, Cl. 66-4.000.

Lear Siegler, Inc.: *See—*
Keiper, Francis P., Jr.; and Kerns, John N., 4,394,543, Cl. 179-84.00R.

Ledjeff, Konstantin. Closure device for lead-acid batteries. 4,394,423, Cl. 429-86.000.

Lee, Jeffrey A.; and Todd, Mike J., to H. B. Fuller Company. Floor cleaning and polishing machine. 4,393,534, Cl. 15-98.000.
Lee, Richard J. Press for reloading rifle and pistol cartridges. 4,393,744, Cl. 86-25.000.
Lee, Rock: *See*—
Boyarsky, Abraham; Friedman, Jack; Christodoulopoulos, Athanasios; and Lee, Rock, 4,393,869, Cl. 128-204.180.
Lee, Teh-Hsung: *See*—
Anagnostopoulos, Constantine N.; and Lee, Teh-Hsung, 4,394,675, Cl. 357-24.000.
Leeper, Charles G., to Hennessy Industries, Inc. Tire changer with combination wheel clamps and bead looseners. 4,393,914, Cl. 157-1.200.
Lefnaer, Otto. Coal dust combustion motor. 4,393,818, Cl. 123-23.000.
Legler, Donald: *See*—
Marten, John A.; Legler, Donald; and Wagoner, Jesse W., 4,393,694, Cl. 73-117.000.
Lehr, Klaus: *See*—
Schrodter, Klaus; and Lehr, Klaus, 4,394,360, Cl. 423-317.000.
Leippe, Michael M.: *See*—
Anderson, Richard J.; and Leippe, Michael M., 4,394,154, Cl. 71-92.000.
Leisner, Ernst, to Robert Bosch GmbH. Deburring chamber for thermal deburring. 4,394,007, Cl. 266-249.000.
Leitgeb, Wilhelm: *See*—
Kreisal, Ottmar; Schurrer, Josef; Motz, Karl; Leitgeb, Wilhelm; and Rosenberg, Heinz, 4,394,582, Cl. 290-4.00C.
Lemanowicz, Mary M.: *See*—
De Briere, John G.; Lemanowicz, Mary M.; Richardson, David L.; and Vanderputten, Willem, 4,394,345, Cl. 376-245.000.
Lemay Corporation: *See*—
Santinelli, Emil, 4,394,099, Cl. 409-104.000.
Lemirande, Rodger P., to Stanley Automatic Openers. Control systems for gates and the like including a motor overload monitoring circuit. 4,394,607, Cl. 318-453.000.
Lens-Card Systems, Inc.: *See*—
Adrian, David L., 4,393,610, Cl. 40-625.000.
Leonardo, Ignazio, to Diamond Communication Products, Inc. Support clip for a dropwire or the like. 4,393,549, Cl. 24-115.00A.
Lesniak, Jeanne M.: *See*—
Smyth, Nicholas P. D.; Lesniak, Jeanne M.; and Stokes, Kenneth B., 4,393,883, Cl. 128-785.000.
Leston, Gerd, to Koppers Company, Inc. Para-cresol halide salt complex useful for separating para-cresol from meta-cresol. 4,394,526, Cl. 568-716.000.
Lettington, Alan H.: *See*—
Green, Geoffrey W.; and Lettington, Alan H., 4,394,400, Cl. 427-38.000.
Leupold & Stevens, Inc.: *See*—
Gibson, Dale E., 4,393,595, Cl. 33-245.000.
Lever Brothers Company: *See*—
Melville, James B., 4,394,127, Cl. 8-137.000.
Levesque, Clarence N., to C. Levesque Co. Inc. Building system. 4,393,632, Cl. 52-235.000.
Levesque, Michel. Waterproof plastic container. 4,393,974, Cl. 206-37.000.
Levitt, George, to Du Pont de Nemours, E. I., and Company. Agricultural sulfonamides. 4,394,506, Cl. 544-321.000.
Lewis, Paul H.; and Nelson, Gerald V., to Texaco Inc. Method for separating straight chain hydrocarbons using zeolites having large crystals. 4,394,254, Cl. 208-310.00Z.
Leybold-Heraeus GmbH: *See*—
Reimpell, Uwe; Grof, Helmut; Knell, Franz-Georg; and Wamser, Anton, 4,394,765, Cl. 373-52.000.
LGZ Landis & Gyr Zug AG: *See*—
Blazso, Eva, 4,394,407, Cl. 427-150.000.
Liang, Po-Lung: *See*—
Croswhite, Howard L.; Liang, Po-Lung; and Fisher, Alan R., 4,393,731, Cl. 74-689.000.
Liaw, H. Ming: *See*—
Helda, Robert W., deceased; Hazeltine, Cynthia, executor; and Liaw, H. Ming, 4,394,352, Cl. 422-232.000.
Libbey-Owens-Ford Company: *See*—
Bueno, Alejandro G.; and Stover, K. Lawrence, 4,394,122, Cl. 432-30.000.
Licenta Patent-Verwaltungs-GmbH: *See*—
Dahlberg, Reinhard, 4,393,576, Cl. 29-572.000.
Liefke, Hans-Georg: *See*—
Janicki, Max; Liefke, Hans-Georg; Keil, Reinhart; and Geyer, Gerd, 4,394,609, Cl. 318-603.000.
Lignotock Verfahrenstechnik GmbH: *See*—
Kiss, Gunter H., 4,394,334, Cl. 264-80.000.
Liljestrand, Walter E., to Smith International, Inc. Degassing system and centrifugal pump. 4,394,140, Cl. 55-184.000.
Lillmars, Alvin E.: *See*—
Clark, Thomas R.; Lillmars, Alvin E.; Roth, Elwood A.; Schmick, Alvin L.; and Todd, Maurice C., 4,393,736, Cl. 83-100.000.
Lindberg, John E., to Owen, Wickersham & Erickson. Combustion and pollution control system. 4,393,817, Cl. 123-3.000.
Lindberg, Richard S.: *See*—
Lapeyre, James M.; Svendsen, Noel A.; Carroll, Raymond J., Jr.; Long, Henry H.; and Lindberg, Richard S., 4,393,544, Cl. 17-73.000.
Linde, Rolf: *See*—
Weiss, Hermann; Klotz, Erhard; Peemoller, Horst; Linde, Rolf; and Mauser, Wilfried, 4,394,063, Cl. 350-162.130.
Linden, Gerbert: *See*—
Buck, Wolfgang; Sehring, Richard; Linden, Gerbert; and Lust, Sigmund, 4,394,159, Cl. 71-98.000.
Linder, Ernst: *See*—
Muller, Klaus; Linder, Ernst; and Maurer, Helmut, 4,393,687, Cl. 73-35.000.
Lion Corporation: *See*—
Miyake, Mikio; Kitoh, Shinya; and Hayashi, Satoshi, 4,394,494, Cl. 526-301.000.
Lippits, Gerardus J. M.: *See*—
Van Pelt, Pieter; and Lippits, Gerardus J. M., 4,394,438, Cl. 430-321.000.
Liptay-Wagner, Nicholas; Renaud, Roland; Pryor, Timothy R.; and Clarke, Donald A., to Diffracto Ltd. New photodetector array based optical measurement systems. 4,394,683, Cl. 358-107.000.
Lisagor, W. Barry: *See*—
Clark, Ronald K.; and Lisagor, W. Barry, 4,393,716, Cl. 73-818.000.
List, Hans: *See*—
Obermayer, Bertram; Skatsche, Othmar; and Greier, Josef, 4,393,822, Cl. 123-195.00R.
Litton Systems, Inc.: *See*—
Flannagan, Alfred, 4,394,600, Cl. 313-500.000.
Liu, Sophia Y.: *See*—
Hardy, Thomas A.; and Liu, Sophia Y., 4,394,330, Cl. 260-932.000.
Lobert, Udo: *See*—
Krull, Manfred; Lobert, Udo; Stamm, Dieter; and Veeser, Klaus, 4,394,411, Cl. 428-70.000.
Loen, Larry W.: *See*—
Hoffman, Roy L.; Houdek, Merle E.; Loen, Larry W.; and Soltis, Frank G., 4,394,727, Cl. 364-200.000.
LogEtronics, Inc.: *See*—
McIntosh, Walter L.; and Street, John N., 4,394,089, Cl. 355-88.000.
Loggers, Hendrik, to Aarding Weerstandlas B.V. Method of producing silicate-containing granulates. 4,394,176, Cl. 106-120.000.
Lombard, Claude, to Regie Nationale Des Usines Renault. Absolute pressure pick-up, especially for measuring pressure at intake in internal combustion engines. 4,393,715, Cl. 73-728.000.
Lometillo, Josephine E.; and Wolcott, John M., to Carnation Company. Process for producing pasta products. 4,394,397, Cl. 426-557.000.
Lone Star Steel Company: *See*—
Greer, James B., 4,394,189, Cl. 148-12.00R.
Long, Donald A.; and Sowash, Thomas R., to General Motors Corporation. Switch assembly with pivoted actuator. 4,394,555, Cl. 200-159.00R.
Long, Henry H.: *See*—
Lapeyre, James M.; Svendsen, Noel A.; Carroll, Raymond J., Jr.; Long, Henry H.; and Lindberg, Richard S., 4,393,544, Cl. 17-73.000.
Long, John V.: *See*—
Gagliani, John; and Long, John V., 4,394,464, Cl. 521-180.000.
Long, Nicholas R.; Peisel, William E.; Ryan, Joseph L.; and Watkins, Richard R., to Honeywell Information Systems Inc. Graphic and data character video display system. 4,394,650, Cl. 340-728.000.
Long, Robert T. Insulated wall construction apparatus. 4,393,635, Cl. 52-309.110.
Lonza-Werke G.m.b.H.: *See*—
Sappelt, Reinhard, 4,394,521, Cl. 564-271.000.
Loof, Philippus: *See*—
Waller, Jan; and Loof, Philippus, 4,394,119, Cl. 431-5.000.
Loos, Horst-Rudolf; and Dupre, Bernard, to Vibro-Meter S.A. Measuring device of the useful load and of the load on the axles of a truck. 4,393,951, Cl. 177-136.000.
Loos, Michel: *See*—
Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, 4,394,728, Cl. 364-200.000.
Lord Corporation: *See*—
Blenner, Donald R., 4,394,205, Cl. 156-307.300.
Lord, Henry A.: *See*—
Bixler, Kenneth D.; Lord, Henry A.; and Reifers, Richard F., 4,394,214, Cl. 162-228.000.
Loser, Wolfgang: *See*—
Muller, Rudi; and Loser, Wolfgang, 4,393,985, Cl. 222-591.000.
Lowdenslager, John R.: *See*—
Willis, Alan E.; Lowdenslager, John R.; and Goldstein, Neal, 4,394,540, Cl. 179-2.0AM.
Lowen, Gerard G.; and Tricamo, Stephen J., to Research Foundation of the City University of New York. Force balancing techniques for complex cyclically moving planar linkages. 4,393,690, Cl. 73-66.000.
Lowery, Richard E.; Gordon, Bruce W.; and Steger, Barry N., to Phillips Petroleum Company. Production of antimony organophosphorodithioates. 4,394,323, Cl. 260-446.000.
Lowndes, Michael W., to Lucas Industries Limited. Battery monitoring system. 4,394,741, Cl. 364-483.000.
Lu, Shau-Zou, to Celanese Corporation. Fiber reinforced polyoxymethylene molding compositions. 4,394,468, Cl. 523-205.000.
Lucas Industries Limited: *See*—
Lowndes, Michael W., 4,394,741, Cl. 364-483.000.
Mowbray, Dorian F.; Fenne, Ivor; and Cavanagh, Eric J., 4,393,846, Cl. 123-502.000.
Skinner, Robert T. J., 4,393,844, Cl. 123-450.000.
Tumber, Brian W., 4,393,826, Cl. 123-198.0DB.
Lucchetta, Sergio, to Maschinenfabrik Schweiter AG. Method and apparatus for joining yarn or thread ends. 4,393,646, Cl. 57-22.000.
Lucia, James: *See*—
Di Leo, Angela M.; and Lucia, James, 4,394,644, Cl. 340-571.000.

Ludington, William D.: *See*—
Adams, Edgar L.; and Ludington, William D., 4,394,052, Cl. 299-18.000.
Lukaszewicz, Helmut: *See*—
Holz, Wilhelm; Lukaszewicz, Helmut; and Gregor, Karl, 4,394,217, Cl. 202-227.000.
Lull, John M., to Hughes Aircraft Company. Dual modulus counter having non-inverting feedback. 4,394,769, Cl. 377-116.000.
Luossavaara-Kiirunavaara AB: *See*—
Merila, Jouni A., 4,394,021, Cl. 277-34.300.
Lust, Sigmund: *See*—
Buck, Wolfgang; Sehring, Richard; Linden, Gerbert; and Lust, Sigmund, 4,394,159, Cl. 71-98.000.
Lutze, Uwe; Scholz, Dieter; and Brennsteiner, Ernst, to Hilti Aktiengesellschaft. Sound attenuating rock drill shank. 4,393,947, Cl. 175-323.000.
Lux, Richard A.: *See*—
Hoffman, James M., Jr.; and Lux, Richard A., 4,394,086, Cl. 355-3.00R.
M.A.N.-Dachauer: *See*—
Kreissl, Ottmar; Schurrer, Josef; Motz, Karl; Leitgeb, Wilhelm; and Rosenberg, Heinz, 4,394,582, Cl. 290-4.00C.
M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Bammert, Karl, 4,394,113, Cl. 418-98.000.
M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft: *See*—
Burger, Rainer, 4,393,772, Cl. 101-217.000.
Cappel, Bert; Schniggenfittig, Gunther; and Schuhmann, Siegfried, 4,393,775, Cl. 101-365.000.
Theilacker, Klaus, 4,393,773, Cl. 101-232.000.
Maag Gear-Wheel & Machine Company Limited: *See*—
Bloch, Peter; and Bickel, Hansjorg, 4,393,625, Cl. 51-165.870.
Machida, Takatoshi: *See*—
Tsukui, Minoru; Sekiguchi, Hiroshi; and Machida, Takatoshi, 4,393,956, Cl. 181-265.000.
Mack, Gerhard: *See*—
Moulding, Michael B.; Muller, Klaus; and Mack, Gerhard, 4,394,043, Cl. 296-97.00H.
Mack Trucks, Inc.: *See*—
Kronstadt, Victor, 4,393,907, Cl. 192-99.00S.
Maclin, Greg P.; and Brandenburger, Allen M., to Container Corporation of America. Envelope-type mailing folder. 4,393,989, Cl. 229-71.000.
Madding, Gary D., to Mead Johnson & Company. Process for production of encainide. 4,394,507, Cl. 546-185.000.
Maddox, Roy L., III, to Rockwell International Corporation. Microelectronic shadow masking process for reducing punchthrough. 4,394,182, Cl. 148-1.500.
Madgavkar, Ajay M.; and Swift, Harold E., to Gulf Research & Development Company. Boron trifluoride-water-silica catalyst. 4,394,296, Cl. 252-433.000.
Maeda, Mamoru: *See*—
Shioya, Yoshimi; Maeda, Mamoru; Takasaki, Kanetake; and Takagi, Mikio, 4,394,401, Cl. 427-39.000.
Magnusson, Klas B. O., to Bulten-Kanthal Aktiebolag. Ladle preheater. 4,394,566, Cl. 219-523.000.
Maguire, Daniel J. Reusable childproof closure. 4,393,976, Cl. 215-211.000.
Mahieu, Marc; Vandenberg, Philippe; and Varon, Jacques J., to U.S. Philips Corporation. Boat for the epitaxial growth from the liquid phase. 4,393,806, Cl. 118-412.000.
Mahon, Douglas K., to Sharp Corporation. Method and apparatus for evaluating recording systems. 4,394,695, Cl. 360-53.000.
Mahoon, Alauddin; and Kohler, Richard P. J., to British Aerospace Public Limited Company. Treatment of titanium prior to bonding. 4,394,224, Cl. 204-57.000.
Maiko, Viktor P., to Juzhnoe Proizvodstvennoe Obiedinenie Po Morskim Geologorazvedochnym Rabotam "JUZHMORGEOLOGIA". Digital tracking phase meter. 4,394,618, Cl. 324-83.00D.
Mailen, James C.: *See*—
Tallent, Othar K.; Dodson, Karen E.; and Mailen, James C., 4,394,269, Cl. 210-690.000.
Makabe, Hachiro; Watanabe, Kazuo; Takenoya, Hideaki; Kume, Toshiaki; and Kakinuma, Toshihide, to Janome Sewing Machine Co. Ltd. Electronic sewing machine. 4,393,795, Cl. 112-158.00E.
Makarewicz, Stanley R.: *See*—
Gardiner, James R; Makarewicz, Stanley R.; Revitz, Martin; and Shepard, Joseph F., 4,394,406, Cl. 427-86.000.
Maki, Emil R.; Freudenstein, Ferdinand; Richard, Raymond L., Jr.; and Chew, Meng-Sang, to General Motors Corporation. Rolling contact rocker arm and pivot. 4,393,820, Cl. 123-90.410.
Makinen, Juho K.; and Kaenniemi, Kaarina M. E., to Outokumpu Oy. Process for removal of harmful impurities from metallurgical sulphide melts. 4,394,164, Cl. 75-21.000.
Malette, William G.; and Quigley, Herbert J., Jr. Method of achieving hemostasis. 4,394,373, Cl. 424-95.000.
Maloy, Rex M., to Coburn, Orin W. Coin chute assembly. 4,393,972, Cl. 194-99.000.
Maloy, Rick D. Earthquake game. 4,394,017, Cl. 273-237.000.
Malpass, Dennis B.; and Yeargin, G. Scott, to Texas Alkyls, Inc. Preparation of alkenoxy aluminum compounds and compounds produced. 4,394,326, Cl. 260-448.0AD.
Manber, Solomon; Chiang, David; and Chu, Mosi, to Amtech Patent Licensing Corp. Indicia recording apparatus. 4,394,076, Cl. 354-5.000.
Mandar, Andre; Fressard, Jules; and Mandar, Martine. Correcting device for the combustion of engines of vehicles during transitional phases of operation. 4,393,855, Cl. 123-587.000.
Mandar, Martine: *See*—
Mandar, Andre; Fressard, Jules; and Mandar, Martine, 4,393,855, Cl. 123-587.000.
Mangetsu, Kenji: *See*—
Shima, Michitsune; Kihara, Shiso; Omichi, Takeo; Igarashi, Taenji; and Mangetsu, Kenji, 4,393,920, Cl. 165-11.00A.
Mann, Arnold; and Collonia, Harald, to VDO Adolf Schindling AG. Device for the control of the traveling speed of a motor vehicle. 4,393,833, Cl. 123-335.000.
Manos, Pavlos. Game using the helical movement of a ball or vehicle. 4,394,016, Cl. 273-109.000.
Marcelin, George: *See*—
Vogel, Roger F.; Marcelin, George; and Swift, Harold E., 4,394,525, Cl. 568-462.000.
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, to Texaco, Inc. Partial oxidation process. 4,394,137, Cl. 48-197.00R.
Marjanovich, Barry S.: *See*—
Garrison, Barney D., Jr.; and Marjanovich, Barry S., 4,394,150, Cl. 71-62.000.
Mark, Harold W.; Bertus, Brent J.; and Roberts, John S., to Phillips Petroleum Company. Stable antimony organophosphorodithioates. 4,394,324, Cl. 260-446.000.
Marossy, Gabor; and Mueller, Warren E., to Armco Inc. Solar collector roof. 4,393,859, Cl. 126-429.000.
Marro, Joseph, Jr.; and Wattles, Gurdon B., to Entoleter, Inc. Combustion fuel emulsion. 4,394,131, Cl. 44-51.000.
Marsh, Walter H. W., to Singer Company, The. Arrangement and method for preventing false triggering in an optically switched buttonhole mechanism. 4,393,797, Cl. 112-158.00B.
Marshall, Richard A.; and Miller, Edward F., to Laboratory Equipment Corp. Manual shift system and method of use for vehicle testing. 4,393,695, Cl. 73-117.300.
Marten, John A.; Legler, Donald; and Wagoner, Jesse W., to Sun Electric Corporation. Vehicle steering and front-end alignment defect detector. 4,393,694, Cl. 73-117.000.
Martenas, Wayne B., to Sperry Corporation. Two-speed drive apparatus for blower fans. 4,393,644, Cl. 56-12.800.
Martin, Eugene R.; and Tripp, Jeffrey A., to SWS Silicones Corporation. Quaternary ammonium functional silicon compounds. 4,394,517, Cl. 556-419.000.
Martin, Henry: *See*—
Sturm, Elmar; Schempp, Heinrich; and Martin, Henry, 4,394,152, Cl. 71-77.000.
Martin, Johannes J. Method and arrangement for reducing NO_x emissions from furnaces. 4,394,118, Cl. 431-4.000.
Martin, John E. Method and apparatus for repairing heat exchangers. 4,393,564, Cl. 29-157.30C.
Martin, Jon W., to TRW Inc. Oxidized carbonaceous materials and vulcanized and vulcanizable rubber compositions reinforced with such carbonaceous materials. 4,394,478, Cl. 524-424.000.
Martin, Roger C. Shrimp processing and handling apparatus. 4,393,543, Cl. 17-72.000.
Martinez, Gonzalo. Polycentric hinge for cast-braces. 4,393,542, Cl. 16-369.000.
Martinot, Roger: *See*—
Mijot, Guy; Derycke, Leon; Dienne, Didier; and Martinot, Roger, 4,393,942, Cl. 172-2.000.
Maruyama, Chisato. Immunotherapeutic agent for tumors comprising lipopolysaccharide as an active component. 4,394,502, Cl. 536-119.000.
Maruyama, Eiichi: *See*—
Tsukada, Toshihisa; Takasaki, Yukio; Hirai, Tadaaki; Baji, Toru; Yamamoto, Hideaki; Tanaka, Yasuo; Maruyama, Eiichi; and Ishioka, Sachio, 4,394,749, Cl. 365-106.000.
Maruyama, Teruo; Onoda, Tadayuki; and Taguchi, Tatsuhisa, to Matsushita Electric Industrial Co., Ltd. Compressor. 4,394,114, Cl. 418-269.000.
Marzka, Richard, to Marzka, Richard; and Krahe, Mark R. Grapple. 4,394,040, Cl. 294-66.00R.
Marzocchi, Alfred: *See*—
Grossi, Anthony V.; Hagelee, Leon A.; Hahn, Louis T.; and Marzocchi, Alfred, 4,394,481, Cl. 525-54.500.
Mas, Joseph A., to Allied Corporation. Multiple pole axial field electromagnetic devices. 4,394,597, Cl. 310-268.000.
Maschinenfabrik Carl Zangs Aktiengesellschaft: *See*—
Brock, Josef, 4,393,902, Cl. 139-76.000.
Maschinenfabrik Schweiter AG: *See*—
Lucchetta, Sergio, 4,393,646, Cl. 57-22.000.
Masly, John R.: *See*—
Goes, Michael J.; Masly, John R.; and Schmidlin, Albertus E., 4,393,783, Cl. 102-529.000.
Mason, Donald L.; and McAllister, Warren A., to Burroughs Wellcome Co. Apparatus for testing medicinal tablets. 4,393,717, Cl. 73-821.000.
Mason, Robert S.: *See*—
Nawash, Michael S.; Stillman, Suzanne; and Mason, Robert S., 4,393,873, Cl. 604-151.000.
Massachusetts Institute of Technology: *See*—
Wnek, Gary E., 4,394,304, Cl. 252-520.000.
Material Sciences Corporation: *See*—
Van Thyne, Ray J.; and Rausch, John J., 4,394,422, Cl. 428-592.000.
Mathbirk Limited: *See*—
Matthews, Denis, 4,393,799, Cl. 112-262.100.

Matsuda, Hiroto: *See—*
Sugitani, Hiroshi; Matsuda, Hiroto; Kimura, Koichi; and Ikeda, Masami, 4,394,670, Cl. 346-140.00R.

Matsumoto, Rempei: *See—*
Tanaka, Takayuki; and Matsumoto, Rempei, 4,393,819, Cl. 123-41.080.

Matsumoto, Seiji: *See—*
Komaki, Takao; and Matsumoto, Seiji, 4,394,737, Cl. 364-414.000.

Matsumoto, Shigeyuki: *See—*
Ozawa, Masakazu; Watanabe, Kunio; Matsumoto, Shigeyuki; Nishimura, Yukuo; and Miyazaki, Takashi, 4,394,669, Cl. 346-140.00R.

Matsumura, Yoshio: *See—*
Yasuta, Naoshi; Matsumura, Yoshio; and Kotani, Teizo, 4,394,402, Cl. 427-40.000.

Matsuo, Hiroshi: *See—*
Kato, Hiroshi; Ato, Hisataka; Inagaki, Osamu; and Matsuo, Hiroshi, 4,394,666, Cl. 346-82.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Igata, Kouichi; and Kobayashi, Masaaki, 4,394,701, Cl. 360-137.000.
Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, 4,394,699, Cl. 360-113.000.
Maruyama, Teruo; Onoda, Tadayuki; and Taguchi, Tatsuhisa, 4,394,114, Cl. 418-269.000.
Mori, Keiichi; Ueda, Yasukiyo; and Mori, Keijiro, 4,393,858, Cl. 126-351.000.
Watanabe, Toshiro, 4,394,680, Cl. 358-22.000.

Matsushita Electric Works, Ltd.: *See—*
Hamashima, Tetsuo; and Kumano, Fumihiro, 4,393,586, Cl. 30-43.600.
Yamamoto, Hideomi; Watanabe, Haruzo; Kishie, Hidehiko; and Nishihara, Toshio, 4,394,412, Cl. 428-174.000.

Matsushita Research Institute Tokyo, Inc.: *See—*
Yoshida, Kunio; Kotera, Hiroaki; Tsuda, Yukifumi; Kamno, Yoshimitsu; and Naka, Motohiko, 4,394,662, Cl. 346-33.00R.

Matthews, Denis, to Mathbirk Limited. Attachment of knitted fabric strip to a piece of fabric. 4,393,799, Cl. 112-262.100.

Mattson, Richard W., to Allied Corporation. Brush wear detector system with latching relay. 4,394,648, Cl. 340-679.000.

Maurer, Alexander; Adrian, Renate; Panter, Herbert; Heymer, Gero; and Nolker, Dieter, to Hoechst Aktiengesellschaft. Production of granular alkali metal diphosphates or triphosphates. 4,394,358, Cl. 423-305.000.

Maurer, Alexander: *See—*
Wasel-Nielen, Horst-Dieter; Maurer, Alexander; and Adrian, Renate, 4,394,359, Cl. 423-305.000.

Maurer, Helmut: *See—*
Muller, Klaus; Linder, Ernst; and Maurer, Helmut, 4,393,687, Cl. 73-35.000.

Mauser, Wilfried: *See—*
Weiss, Hermann; Klotz, Erhard; Peemoller, Horst; Linde, Rolf; and Mauser, Wilfried, 4,394,063, Cl. 350-162.130.

May, Charles W., to Deere & Company. Low pressure sealing arrangement for a fuel injector. 4,393,847, Cl. 123-502.000.

Mayo, Henry C.; and Millman, William V., to United States of America, Army. Releasable retainer for ejection tube. 4,393,745, Cl. 89-1.806.

Mazur, Michael B.; and Punko, Emil M., to AAA Sales & Engineering, Inc. Low noise railroad retarder brake shoe structure. 4,393,960, Cl. 188-62.000.

McAfee, Richard C.; Adkins, James; and Miskowski, Richard L., to SWS Silicones Corporation. Platinum-styrene complexes which promote hydrosilation reactions. 4,394,317, Cl. 260-429.00R.

McAllister, Warren A.: *See—*
Mason, Donald L.; and McAllister, Warren A., 4,393,717, Cl. 73-821.000.

McCartney, Damien: *See—*
Yeomans, David; Wilkinson, Christopher J.; McCartney, Damien; and O'Dwyer, Micheal, 4,394,685, Cl. 358-264.000.

McClelland, Henry T.; and Kuhn, Joseph B., to Cabot Berylco, Inc. Processing for copper beryllium alloys. 4,394,185, Cl. 148-11.50C.

McCord, James W. Vapor condensate return means in a vapor generating and recovery apparatus. 4,394,216, Cl. 202-170.000.

McCoy, John F., III: *See—*
Thimons, Edward D.; Heller, Kenneth S.; McCoy, John F., III; and Whillier, Austin, 4,394,142, Cl. 55-242.000.

McDermott, Thomas R.; and Jackson, Robert K., to Clark-Cutler-McDermott Company. Roofing system and needle punched impregnated synthetic fiber fabric. 4,393,634, Cl. 52-309.100.

McDonnell Douglas Corporation: *See—*
Randall, John R., 4,393,730, Cl. 74-538.000.
Richman, David W.; and Walker, Charles D., 4,394,246, Cl. 204-301.000.

McGalliard, James D. Printed circuit fuse assembly. 4,394,639, Cl. 337-292.000.

McGilvray, Bruce L.: *See—*
Flusche, Frederick O.; Gustafson, Richard N.; and McGilvray, Bruce L., 4,394,731, Cl. 364-200.000.

McIntosh, Walter L.; and Street, John N., to LogEtronics, Inc. Color photoprinting with a scanning memory mask. 4,394,089, Cl. 355-88.000.

McKenzie, James A.; and Peterson, Joe W., to Motorola, Inc. CMOS Differential comparator with hysteresis. 4,394,587, Cl. 307-355.000.

McKinney, Osborne K.; and Flores, David P., to Dow Chemical Company, The. The Product and process for reducing block and increasing slip of linear low density ethylene copolymer films. 4,394,474, Cl. 524-232.000.

McMahon, William; and Jensen, Bernard. Fiberoptic-lighted optical apparatus. 4,394,074, Cl. 351-206.000.

McMurray, John H.; and Miller, Jule, to Avco Corporation. Brazing filler metal composition and process. 4,394,347, Cl. 420-453.000.

Mead Johnson & Company: *See—*
Madding, Gary D., 4,394,507, Cl. 546-185.000.

Meadox Instruments, Inc.: *See—*
Kahn, Alan R., 4,393,878, Cl. 128-748.000.

Measuregraph Company, The: *See—*
Shalon, Tadmor, 4,394,740, Cl. 364-464.000.

Mecilec: *See—*
Guillemot, Philippe, 4,393,713, Cl. 73-701.000.

Medtronic, Inc.: *See—*
Smyth, Nicholas P. D.; Lesniak, Jeanne M.; and Stokes, Kenneth B., 4,393,883, Cl. 128-785.000.

Mehra, Ravinder C.; and Aggarwal, Raj K., to Sybron Corporation. Pressure filter adapter and containment vessel. 4,394,266, Cl. 210-244.000.

Meier, Hans, to Sulzer Brothers Limited. Piston compressor. 4,393,752, Cl. 92-86.000.

Meindl, Hubert: *See—*
Strasilla, Dieter; Moldovanyi, Laszlo; Fearnley, Charles; and Meindl, Hubert, 4,393,886, Cl. 132-7.000.

Meitzler, Allen H.; Donlon, William T., Jr.; and Schinozaki, Samuel S., to Ford Motor Company. Titanium dioxide rectifier. 4,394,672, Cl. 357-10.000.

Mekuchi, Yutaka: *See—*
Kishida, Katsuhiro; Mekachi, Yutaka; Hirao, Sumio; and Date, Hirohiko, 4,394,560, Cl. 219-137.0WM.

Melrose, James C.: *See—*
Savins, Joseph G.; and Melrose, James C., 4,393,934, Cl. 166-261.000.

Melville, James B., to Lever Brothers Company. Method of depositing perfume and compositions therefor. 4,394,127, Cl. 8-137.000.

Menasha Corporation: *See—*
Stevens, Bruce W., 4,394,096, Cl. 403-408.000.

Mendez, Luis E.: *See—*
Ross, Richard J.; and Mendez, Luis E., 4,393,930, Cl. 166-188.000.

Menezes, William A.; and Kuper, Douglas D., to Sony Corporation. Video editing apparatus. 4,394,745, Cl. 364-900.000.

Menna, Raymond J.: *See—*
Kumar, Mahesh; Menna, Raymond J.; and Huang, Ho-Chung, 4,394,629, Cl. 333-109.000.

Mercer, Frank B., to P.L.G. Research Limited. Forming plastic articles having strands by stretching. 4,394,342, Cl. 264-292.000.

Mercer, Paul A., to Bell Telephone Laboratories, Incorporated. Tone generation method and apparatus using stored reference calibration coefficients. 4,394,743, Cl. 364-514.000.

Merck & Co., Inc.: *See—*
Cragoe, Edward J., Jr., 4,394,385, Cl. 424-285.000.
Rokach, Joshua; Rooney, Clarence S.; and Cragoe, Edward J., Jr., 4,394,515, Cl. 549-12.000.

Mergel, Jurgen: *See—*
Divisek, Jiri; and Mergel, Jurgen, 4,394,244, Cl. 204-295.000.

Merila, Jouni A., to Luossavaara-Kiirunavaara AB. Contact sealing. 4,394,021, Cl. 277-34.300.

Merix Corporation: *See—*
Mix, Thomas W.; and Dweck, Jay S., 4,394,219, Cl. 203-1.000.

Merlino, Paul J.: *See—*
Fry, Warren C.; Franz, James H.; and Merlino, Paul J., 4,394,724, Cl. 363-124.000.

Merritt, Robert C.; and Terwilliger, Gerald L., to Eaton Corporation. Linkage mechanism for supercharger system. 4,393,852, Cl. 123-564.000.

Metal Box Limited: *See—*
Ball, Martin F.; and Fidler, Fred, 4,393,979, Cl. 220-270.000.

Micro-Plate, Inc.: *See—*
Eidschun, Charles D., 4,393,705, Cl. 73-439.000.

Mid-Continent Aircraft Corporation: *See—*
Cook, Richard J.; and Reade, Richard, 4,394,108, Cl. 414-680.000.

Middleton, William J., to Du Pont de Nemours, E. I., and Company. Fluorinated carbamate insecticides. 4,394,386, Cl. 424-298.000.

Midland Steel Products: *See—*
Satava, George L.; and Deemer, Carroll L., 4,394,194, Cl. 148-131.000.

Mierzwa, George A.: *See—*
Muzumdar, Deepak; Mierzwa, George A.; Sanders, Richard; and Van der Meiden, Orrie J., 4,394,757, Cl. 370-100.000.

Mijot, Guy; Derycke, Leon; Dienne, Didier; and Martinot, Roger, to Attelages Lemoine - La Mecano - Soudure Remoise. Vehicle-supported three-point coupling and position responsive fluid blocking device therefor. 4,393,942, Cl. 172-2.000.

Miles Laboratories, Inc.: *See—*
Brock, David A.; and Gupta, Surendra K., 4,394,450, Cl. 435-191.000.
Cameron, Erma C.; Gunter, Claude R.; and White-Stevens, Rodric H., 4,394,444, Cl. 435-11.000.

Milex Products, Inc.: *See—*
Milgrom, Hyman T., 4,393,879, Cl. 128-758.000.

Milford, George N., Jr., to Du Pont de Nemours, E. I., and Company. Bead polymerization process for preparing polybenzimidazole. 4,394,500, Cl. 528-313.000.

Milgrom, Hyman T., to Milex Products, Inc. Tissue-collecting apparatus. 4,393,879, Cl. 128-758.000.

Miller, Conrad E., to Du Pont de Nemours, E. I., and Company. Post-stretch water-dispersible subbing composition for polyester film base. 4,394,442, Cl. 430-532.000.
Miller, Edward F.: *See—*
Marshall, Richard A.; and Miller, Edward F., 4,393,695, Cl. 73-117.300.
Miller, Gerald O.: *See—*
Anderson, Charles N.; Elrod, Samuel D.; and Miller, Gerald O., 4,393,987, Cl. 228-157.000.
Miller, J. Wayne; and Simpson, Howard D., to Union Oil Company of California. Hydrodesulfurization catalyst on lithium-containing support and method for its preparation. 4,394,302, Cl. 252-465.000.
Miller, Jule: *See—*
McMurray, John H.; and Miller, Jule, 4,394,347, Cl. 420-453.000.
Miller, Paul B.; and Miller, Tony C. R. Pool cleaning apparatus. 4,393,526, Cl. 4-490.000.
Miller, Stephen J., to Chevron Research Company. Hydrocarbon conversion with crystalline silicate particle having an aluminum-containing outer shell. 4,394,251, Cl. 208-111.000.
Miller, Stephen J., to Chevron Research Company. Crystalline silicate particle having an aluminum-containing outer shell. 4,394,362, Cl. 423-328.000.
Miller, Tony C. R.: *See—*
Miller, Paul B.; and Miller, Tony C. R., 4,393,526, Cl. 4-490.000.
Miller, William A.: *See—*
Chung, Daniel C.; Miller, William A.; and Baumgaertner, Eugene R., 4,394,460, Cl. 521-92.000.
Millick, William H., III, to Hercofina. Partially hydrolyzed, DMT process residue, and useful propylene oxide derivative thereof. 4,394,286, Cl. 252-182.000.
Milliken Research Corporation: *See—*
Satterfield, Larry S., 4,393,725, Cl. 73-862.410.
Stokes, Jimmy L., 4,393,562, Cl. 26-2.00R.
Millman, William V.: *See—*
Mayo, Henry C.; and Millman, William V., 4,393,745, Cl. 89-1.806.
Milner, Peter H.: *See—*
Bentley, Peter H.; Hardy, Kenneth D.; and Milner, Peter H., 4,394,375, Cl. 424-114.000.
Minnesota Mining and Manufacturing Company: *See—*
Beck, Warren R., 4,393,901, Cl. 138-145.000.
Brown, Harvey A.; and Huffman, William A., 4,394,070, Cl. 350-349.000.
Gatzke, Kenneth G., 4,394,433, Cl. 430-151.000.
Hogenson, Raymond A., 4,394,010, Cl. 271-22.000.
Nygard, James C.; Weiss, Melvin P.; and Larsen, Thomas E., 4,393,804, Cl. 118-60.000.
Rohloff, Robert R., 4,394,434, Cl. 430-270.000.
Smith, George H., 4,394,403, Cl. 427-42.000.
Minolta Camera Kabushiki Kaisha: *See—*
Hanamoto, Hiroyuki; and Horie, Yoshihiro, 4,394,088, Cl. 355-14.00R.
Irie, Yutaka; Nagata, Kenzo; and Ito, Hideo, 4,394,087, Cl. 355-14.00E.
Miracle Recreation Equipment Company: *See—*
Ahrens, Claude W., 4,393,812, Cl. 119-16.000.
Mirowski, Mieczyslaw: *See—*
Imran, Mir; and Kolenik, Steve, 4,393,877, Cl. 128-705.000.
Miskowski, Richard L.: *See—*
McAfee, Richard C.; Adkins, James; and Miskowski, Richard L., 4,394,317, Cl. 260-429.00R.
Missouri Research Laboratories, Inc.: *See—*
Frees, Kenneth A.; and Quick, Thomas E., 4,394,106, Cl. 414-622.000.
Mitchell, Gordon B. Tipping trailer. 4,394,105, Cl. 414-436.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Ishii, Toshiaki, 4,394,721, Cl. 363-44.000.
Kato, Masahisa; Kasugai, Syouji; and Gouda, Osamu, 4,393,801, Cl. 112-282.000.
Shima, Kenji; and Hibino, Masahiro, 4,394,536, Cl. 179-1.00G.
Shima, Kenji; and Hibino, Masahiro, 4,394,537, Cl. 179-1.00G.
Wakamiya, Yoshinori; Hamasaki, Yoshiharu; Kutsuzawa, Masaki; and Mitsubishi Denki Kabushiki Kaisha, 4,394,121, Cl. 432-11.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Shima, Michitsune; Kihara, Shiso; Omichi, Takeo; Igarashi, Taenji; and Mangetsu, Kenji, 4,393,920, Cl. 165-11.00A.
Mitsubishi Petrochemical Company Limited: *See—*
Fuwa, Masaru, 4,394,338, Cl. 264-135.000.
Mitsui Aluminum Co., Ltd.: *See—*
Kuwahara, Kenshi, 4,394,167, Cl. 75-68.00A.
Miura, Norio: *See—*
Takahashi, Kenji; Yamazaki, Hisashi; Miyahara, Junji; Kotera, Noboru; Eguchi, Shusaku; and Miura, Norio, 4,394,581, Cl. 250-484.100.
Mix, Thomas W.; and Dweck, Jay S., to Merix Corporation. Fractionating liquids. 4,394,219, Cl. 203-1.000.
Miya, Kazuhiko: *See—*
Sato, Kanemasa; Ueno, Sadayasu; and Miya, Kazuhiko, 4,393,697, Cl. 73-118.000.
Miyahara, Junji: *See—*
Takahashi, Kenji; Yamazaki, Hisashi; Miyahara, Junji; Kotera, Noboru; Eguchi, Shusaku; and Miura, Norio, 4,394,581, Cl. 250-484.100.
Miyake, Mikio; Kitoh, Shinya; and Hayashi, Satoshi, to Lion Corporation. Dental filling material. 4,394,494, Cl. 526-301.000.
Miyake, Tetsuya; Takeda, Kunihiko; Onitsuka, Hatsuki; Okuyama, Kazuo; and Shimamura, Yasuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Separation of rare earth metals using a cation exchanger. 4,394,353, Cl. 423-21.500.
Miyao, Masanobu: *See—*
Wada, Yasuo; Usui, Hiroo; Ohkura, Makoto; Miyao, Masanobu; Tamura, Masao; and Tokuyama, Takashi, 4,394,191, Cl. 148-33.100.
Miyazaki, Takashi: *See—*
Ozawa, Masakazu; Watanabe, Kunio; Matsumoto, Shigeyuki; Nishimura, Yukuo; and Miyazaki, Takashi, 4,394,669, Cl. 346-140.00R.
Miyazaki, Yoshihisa, to Nissin Kogyo Kabushiki Kaisha. Vacuum actuated type booster device. 4,393,749, Cl. 91-376.00R.
Mizokami, Kazunori, to Olympus Optical Company Ltd. Photoelectric conversion circuit. 4,394,570, Cl. 250-209.000.
Mizusawa, Akira: *See—*
Yuda, Takuo; and Mizusawa, Akira, 4,393,556, Cl. 24-230.00R.
Mobay Chemical Corporation: *See—*
Allen, Gary F., 4,394,522, Cl. 564-451.000.
Allen, Gary F., 4,394,523, Cl. 564-451.000.
Mobbs, David B.: *See—*
Mounsey, Diana M.; and Mobbs, David B., 4,394,357, Cl. 423-140.000.
Moberg, Gregory O., to Eastman Kodak Company. Current control apparatus for a flyback capacitor charger. 4,394,719, Cl. 363-18.000.
Mobil Oil Corporation: *See—*
Andress, Harry J., 4,394,135, Cl. 44-71.000.
Chu, Chin C.; and Kaeding, Warren W., 4,394,300, Cl. 252-455.00Z.
Horodysky, Andrew G.; and Kaminski, Joan M., 4,394,278, Cl. 252-46.300.
Rowe, Carleton N., 4,394,134, Cl. 44-62.000.
Savins, Joseph G.; and Melrose, James C., 4,393,934, Cl. 166-261.000.
Shen, Roderick C., 4,394,249, Cl. 208-89.000.
Modderkolk, Rutger: *See—*
Herwegh, Karl J.; and Modderkolk, Rutger, 4,393,558, Cl. 24-230.00R.
Modrovich, Ivan E. Stabilization of coenzymes in aqueous solution. 4,394,449, Cl. 435-188.000.
Mohr, Richard A.: *See—*
Berkowitz, Sidney; and Mohr, Richard A., 4,394,361, Cl. 423-321.00S.
Mohrle, Werner: *See—*
Drews, Ulrich; Werner, Peter; and Mohrle, Werner, 4,393,841, Cl. 123-440.000.
Mol, Hans C.; and Byrne, LeRoy H., to Pitney Bowes Inc. Fluid supply and dispensing apparatus. 4,393,894, Cl. 137-454.000.
Moldovanyi, Laszlo: *See—*
Strasilla, Dieter; Moldovanyi, Laszlo; Fearnley, Charles; and Meindl, Hubert, 4,393,886, Cl. 132-7.000.
Mollier, Pierre: *See—*
Boudon, Gerard; Denis, Bernard; de Grivel, Virginie; and Mollier, Pierre, 4,394,752, Cl. 365-227.000.
Mollier, Pierre B.: *See—*
Grandguillot, Michel J.; Mollier, Pierre B.; and Nuez, Jean-Paul J., 4,394,747, Cl. 365-104.000.
Monsanto Company: *See—*
Serlin, Irving, 4,394,479, Cl. 524-459.000.
Montalto, Anthony R.; Scerbo, Louis J.; and Starace, Jeremia P., to Bell Telephone Laboratories, Incorporated. Electrical access tool for engaging recessed test points. 4,394,620, Cl. 324-149.000.
Mooradian, Gregory C., to United States of America, Navy. Balloon collector/director sunsubsatcom concept. 4,394,780, Cl. 455-618.000.
Moore, Constance R. Refrigerated lip stick container. 4,393,975, Cl. 206-385.000.
Moore, James W., to Deere & Company. Rear bagger attachment for lawn mower. 4,393,645, Cl. 56-202.000.
Moore, Mae Lois: *See—*
Bodmin, Syd E., 4,393,811, Cl. 119-14.470.
Morand, Alfred: *See—*
Rostagno, Walter; and Morand, Alfred, 4,394,395, Cl. 426-285.000.
Mori, Kazuyuki: *See—*
Suzuki, Kouichi; and Mori, Kazuyuki, 4,394,739, Cl. 364-426.000.
Mori, Keiichi; Ueda, Yasukiyo; and Mori, Keijiro, to Matsushita Electric Industrial Co., Ltd. Combustion control system. 4,393,858, Cl. 126-351.000.
Mori, Keijiro: *See—*
Mori, Keiichi; Ueda, Yasukiyo; and Mori, Keijiro, 4,393,858, Cl. 126-351.000.
Morimoto, Kiyoshi; and Takagi, Toshinori, to Futaba Denshi Kogyo K.K. Process for forming a lead film. 4,394,210, Cl. 156-608.000.
Morioka, Akitoshi: *See—*
Yoshino, Tsunemi; Kashihara, Toshitsugu; Iwata, Hiroshi; and Morioka, Akitoshi, 4,394,077, Cl. 354-25.000.
Morisaki, Hiroshi: *See—*
Homma, Yoshio; Tsunekawa, Sukeyoshi; Morisaki, Hiroshi; and Harada, Seiki, 4,394,245, Cl. 204-298.000.
Morooka, Shinichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Water level gauge for a nuclear reactor. 4,394,346, Cl. 376-258.000.
Morozumi, Shinji, to Kabushiki Kaisha Suwa Seikosha. Dynamic divider circuit. 4,394,586, Cl. 377-105.000.
Morris, Hal C., to Rohm and Haas Company. Method of sizing polyester yarn. 4,394,128, Cl. 8-138.000.
Morrison, Dennis J.: *See—*
Grunes, Howard E.; and Morrison, Dennis J., 4,393,663, Cl. 62-119.000.

Morrow, Stanley J.: *See*—
Bertelsman, Dale M.; Eckert, William M.; and Morrow, Stanley J., 4,394,455, Cl. 501-117.000.
Moser, Gottfried: *See*—
Fischer, Friedrich B.; and Moser, Gottfried, 4,393,824, Cl. 123-196.0AB.
Moser, Helmut, to Sandoz Ltd. Copper phthalocyanines having trimethylammoniumnethyl groups as paper dyes. 4,394,130, Cl. 8-661.000.
Moser, Henry D., to Texaco Inc. System for controlling clarification of boiler feed water and the like. 4,394,261, Cl. 210-96.100.
Moshofsky, Jerome F.: *See*—
Jacobsen, Kenneth J.; and Moshofsky, Jerome F., 4,393,925, Cl. 165-122.000.
Mosier, Leo D. Wood roof truss construction. 4,393,637, Cl. 52-644.000.
Motorola, Inc.: *See*—
Borras, Jaime A.; Gonzalez, Ruben J.; Smith, Daniel M.; and Wieczorek, Alfred B., 4,394,776, Cl. 455-76.000.
Campbell, Jules D., Jr., 4,394,748, Cl. 365-104.000.
Gercekci, Anil, 4,394,750, Cl. 365-218.000.
Helda, Robert W., deceased; Hazeltine, Cynthia, executor; and Liaw, H. Ming, 4,394,352, Cl. 422-232.000.
McKenzie, James A.; and Peterson, Joe W., 4,394,587, Cl. 307-355.000.
Winchell, Vern H., II; Scharr, Thomas A.; and Clark, Lowell E., 4,394,678, Cl. 357-68.000.
Zwald, Henry J., 4,393,583, Cl. 29-857.000.
Motsinger, Donald L.: *See*—
Brown, Daniel G.; and Motsinger, Donald L., 4,394,414, Cl. 428-288.000.
Motz, Karl: *See*—
Kreissl, Ottmar; Schurrer, Josef; Motz, Karl; Leitgeb, Wilhelm; and Rosenberg, Heinz, 4,394,582, Cl. 290-4.00C.
Moulding, Michael B.; Muller, Klaus; and Mack, Gerhard, to Ford Motor Company. Sun visor. 4,394,043, Cl. 296-97.00H.
Mounsey, Diana M.; and Mobbs, David B., to Interox Chemicals Ltd. Separation of cobalt and nickel by oxidative precipitation with peroxymonosulfuric acid. 4,394,357, Cl. 423-140.000.
Mowbray, Dorian F.; Fenne, Ivor; and Cavanagh, Eric J., to Lucas Industries Limited. Fuel pumping apparatus. 4,393,846, Cl. 123-502.000.
Moyce, John J.: *See*—
Hutt, Peter R.; and Moyce, John J., 4,394,687, Cl. 358-147.000.
Mueller, Warren E.: *See*—
Marossy, Gabor; and Mueller, Warren E., 4,393,859, Cl. 126-429.000.
Muller, Klaus; Linder, Ernst; and Maurer, Helmut, to Robert Bosch GmbH. Sensor arrangement. 4,393,687, Cl. 73-35.000.
Muller, Klaus: *See*—
Moulding, Michael B.; Muller, Klaus; and Mack, Gerhard, 4,394,043, Cl. 296-97.00H.
Muller, Manfred: *See*—
Gotze, Gerd-Wolfgang; and Muller, Manfred, 4,394,627, Cl. 331-66.000.
Muller, Rolf: *See*—
Schmider, Fritz; and Muller, Rolf, 4,394,594, Cl. 310-68.00R.
Muller, Rudi; and Loser, Wolfgang, to Vesuvius International Corporation. Ladle shroud support assembly. 4,393,985, Cl. 222-591.000.
Muller, Werner; and Bunemann, Hans, to Boehringer Mannheim GmbH. Adsorbent for the affinity-specific separation of macromolecular materials. 4,394,487, Cl. 525-281.000.
Munchberg, Wolfgang: *See*—
Rosener, Karlheinz; Roeder, Alfred; Munchberg, Wolfgang; Richrath, Herbert; and Chmiel, Max, 4,394,454, Cl. 501-112.000.
Munro, John H. Exhaust system for internal combustion engines. 4,393,652, Cl. 60-295.000.
Munsch, Paul: *See*—
Scheuble, Max; and Munsch, Paul, 4,394,172, Cl. 106-38.50D.
Munz, Johann, to Team Form AG. Arrangement for mounting a door. 4,393,623, Cl. 49-248.000.
Murakami, Kazuya, to Takara Co., Ltd. Rocket train toy assembly. 4,393,620, Cl. 46-201.000.
Murata Manufacturing Co., Ltd.: *See*—
Sakabe, Yukio; and Nishioka, Goro, 4,394,456, Cl. 501-138.000.
Murata, Masayoshi: *See*—
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,394,384, Cl. 424-246.000.
Murayama, Hideo: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Murayama, Hideo; Ishimatsu, Kenji; Ogushi, Akira; and Takami, Katsumi, 4,394,576, Cl. 250-366.000.
Murch, Mason D. Doll eye having insert forming the iris. 4,393,619, Cl. 46-165.000.
Murphy, James E.; and Reid, Kenneth H., to General Motors Corporation. Belt clamp for retractor. 4,394,034, Cl. 280-801.000.
Murphy, Robert P. Floating knife assembly for a meat defatting machine. 4,393,761, Cl. 99-589.000.
Musaev, Irsali K.: *See*—
Golovanov, Alexandr V.; Eschenko, Vladislav Y.; Musaev, Irsali K.; and Talibdzhanov, Zakhidzhan S., 4,394,120, Cl. 431-284.000.
Muscatell, Ralph P. Thermal and vacuum tracking carburetor jet with electronic control. 4,393,838, Cl. 123-435.000.
Muse, John F.; Callihan, Rudy B.; Goad, Bobby F.; and Wainwright, Clyde S., Jr., to Baker International Corporation. Combination hydraulically set hanger assembly with expansion joint. 4,393,931, Cl. 166-208.000.
Muskulus, Willi, to Balzer & Droll KG. Method and device for winding stators or the like. 4,393,904, Cl. 140-92.100.
Muzumdar, Deepak; Mierzwa, George A.; Sanders, Richard; and Van der Meiden, Orrie J., to Siemens Corporation. Frame format for PCM speech data in a telephone transmission system and digital telephone apparatus for use with this frame format. 4,394,757, Cl. 370-100.000.
Nabeshima, Daiki, to Tokyo Shibaura Denki Kabushiki Kaisha. Pulse-code modulation signal processing circuit. 4,394,762, Cl. 371-38.000.
Nabisco Brands, Inc.: *See*—
Anderson, Richard J.; and Leippe, Michael M., 4,394,154, Cl. 71-92.000.
Naderhoff, Bryan A.: *See*—
Nelson, Donald L.; and Naderhoff, Bryan A., 4,394,497, Cl. 528-101.000.
Nagai, Kunio: *See*—
Amano, Toshio; Nagai, Kunio; and Honma, Juri, 4,394,691, Cl. 358-194.100.
Nagakura, Masahiko: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,394,382, Cl. 424-283.000.
Naganawa, Hiroshi: *See*—
Umezawa, Hamao; Shimada, Nobuyoshi; Naganawa, Hiroshi; Takita, Tomohisa; Hamada, Masa; and Takeuchi, Tomio, 4,394,446, Cl. 435-88.000.
Nagano, Genzo; and Takahashi, Masao, to Fujitsu Limited. Error-correcting system. 4,394,763, Cl. 371-38.000.
Nagata, Kenzo: *See*—
Irie, Yutaka; Nagata, Kenzo; and Ito, Hideo, 4,394,087, Cl. 355-14.00E.
Nagata, Wataru: *See*—
Kamata, Susumu; and Nagata, Wataru, 4,394,505, Cl. 544-91.000.
Nagelkerke, Petrus J. J., to U.S. Philips Corporation. Dry-shaving apparatus with hair-trimming means. 4,393,585, Cl. 30-34.100.
Nair, Kumaran M., to Du Pont de Nemours, E. I., and Company. Thick film conductor compositions. 4,394,171, Cl. 106-1.140.
Naito, Mitsuo. Air-cooled cables with terminals and method of producing same. 4,394,533, Cl. 174-74.00R.
Naito, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Apparatus and method for detecting crank shaft orientation and valve assembly in an internal combustion engine. 4,393,693, Cl. 73-116.000.
Naito, Takayuki: *See*—
Kamachi, Hajime; Okumura, Jun; Naito, Takayuki; and Oka, Masahisa, 4,394,503, Cl. 544-25.000.
Naka, Motohiko: *See*—
Yoshida, Kunio; Kotera, Hiroaki; Tsuda, Yukifumi; Kanno, Yoshimitsu; and Naka, Motohiko, 4,394,662, Cl. 346-33.00R.
Nakamura, Kazuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Focus detecting method and apparatus. 4,394,569, Cl. 250-204.000.
Nakamura, Michio: *See*—
Komatsu, Shigeru; and Nakamura, Michio, 4,394,436, Cl. 430-311.000.
Nakano, Junji: *See*—
Shimamura, Tadao; Nakano, Junji; and Seo, Yasufumi, 4,394,336, Cl. 264-109.000.
Nakata, Yukihiko: *See*—
Takeda, Mikio; Kakihara, Yoshinobu; Yoshida, Masaru; and Nakata, Yukihiko, 4,394,601, Cl. 313-509.000.
Nakatsu, Yoshinobu, to Hitachi, Ltd. Card reading apparatus. 4,394,568, Cl. 235-475.000.
Nakayama, Shigeru: *See*—
Nishikawa, Masaji; Amemiya, Norio; Yasuda, Tadahiro; and Nakayama, Shigeru, 4,394,427, Cl. 430-68.000.
Nakayama, Tadashi: *See*—
Harase, Jiro; and Nakayama, Tadashi, 4,394,188, Cl. 148-12.0EA.
Naki, Minoru: *See*—
Satoh, Shingo; Inoue, Takashi; Naki, Minoru; and Kawauchi, Yuji, 4,394,165, Cl. 75-60.000.
Napco, Inc.: *See*—
Scanlon, George R., 4,394,241, Cl. 204-198.000.
Nappholz, Tibor A.; Hinch, Barry; and Shaw, David B., to Telectronics Pty. Ltd. Bradycardia event counting and reporting pacer. 4,393,874, Cl. 128-419.0PT.
Narasaka, Shin: *See*—
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,393,842, Cl. 123-440.000.
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,393,843, Cl. 123-440.000.
Nation, Robert H.: *See*—
Anderson, Forest L.; and Nation, Robert H., 4,393,656, Cl. 60-618.000.
National Institute of Radiological Sciences: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Murayama, Hideo; Ishimatsu, Kenji; Ogushi, Akira; and Takami, Katsumi, 4,394,576, Cl. 250-366.000.
National Research Development Corporation: *See*—
Green, Geoffrey W.; and Lettington, Alan H., 4,394,400, Cl. 427-38.000.
National Semiconductor Corporation: *See*—
Dunkley, James L.; and Dobkin, Robert C., 4,393,575, Cl. 29-571.000.
Nava, Louis J.; and Ewing, Neal L., to Foremost-McKesson, Inc. Process for producing dry discrete agglomerated garlic and onion and resulting products. 4,394,394, Cl. 426-285.000.

Navarro, Ramon. Method for attaching wooden forms to a concrete surface. 4,393,568, Cl. 29-432.000.

Nawash, Michael S.; Stillman, Suzanne; and Mason, Robert S. Gastrostomy and other percutaneous transport tubes. 4,393,873, Cl. 604-151.000.

NCR Canada Ltd. - NCR Canada Ltee: *See*—
Osmera, Miroslav S.; and Brooks, Ralf M., 4,394,092, Cl. 400-120.000.

NCR Corporation: *See*—
Armstrong, Rolfe D., 4,394,729, Cl. 364-200.000.

Nederlandse Pillo-Pak Maatschappij B.V.: *See*—
Herwegh, Karl J.; and Modderkolk, Rutger, 4,393,558, Cl. 24-230.00R.

Nelson, Conrad E.: *See*—
Kenyon, S. Wayne; Geyer, Bernard H., Jr.; and Nelson, Conrad E., 4,394,630, Cl. 333-116.000.

Nelson, Donald L.; and Naderhoff, Bryan A., to Dow Chemical Company, The. Solid materials prepared from epoxy resins and phenolic hydroxyl-containing materials. 4,394,497, Cl. 528-101.000.

Nelson, Gerald V.: *See*—
Lewis, Paul H.; and Nelson, Gerald V., 4,394,254, Cl. 208-310.00Z.

Nelson, Loren D., to Ophir Corporation. Apparatus for measuring vapor density, gas temperature, and saturation ratio. 4,394,575, Cl. 250-343.000.

Nero, Leroy W., to RCA Corporation. Television receiver high voltage generator. 4,394,722, Cl. 363-68.000.

Neukirch, Edward O.: *See*—
Fallon, William H.; Schober, William R.; Neukirch, Edward O.; and Kirby, Donald W., 4,394,611, Cl. 320-21.000.

Nicastro, Norman J. Combination visor and sweatband. 4,393,519, Cl. 2-12.000.

Nicholas, Keith H., to U.S. Philips Corporation. Methods of manufacturing a semiconductor device having a channel region spaced inside channel stoppers. 4,394,181, Cl. 148-1.500.

Nicolas, Edgard, to Solvay & Cie. Cathode for the electrolytic production of hydrogen. 4,394,231, Cl. 204-129.000.

Nieboer, Gerrit, to U.S. Philips Corporation. Play-free hook-type connection. 4,394,054, Cl. 312-7.200.

Niedecker, Herbert. Device for closing gathered ends of wrappers with U-shaped clips. 4,393,641, Cl. 53-138.00A.

Nielsen, Eyvind S.: *See*—
Pedersen, Niels R.; and Nielsen, Eyvind S., 4,393,815, Cl. 122-31.00R.

Niezgoda, Thomas A.; and Oppenheimer, Carl P., to Wurlitzer Company, The. Programmable tone generator. 4,393,740, Cl. 84-1.010.

Nifco, Inc.: *See*—
Yuda, Takuo; and Mizusawa, Akira, 4,393,556, Cl. 24-230.00R.
Yuda, Takuo, 4,393,561, Cl. 24-297.000.

Nihon Den-Nitsu Keiki Co., Ltd.: *See*—
Kondo, Kenshi, 4,393,525, Cl. 4-420.200.

Nihon Nosan Kogyo K.K.: *See*—
Kamimae, Hiroshi; and Ishikawa, Tadashi, 4,394,376, Cl. 424-150.000.

Ninomiya, Ichiro; and Takayama, Jun, to Sony Corporation. Tape synchronizing apparatus. 4,394,694, Cl. 360-14.300.

Nippon Denso Company Limited: *See*—
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, 4,393,966, Cl. 192-56.00R.

Nippon Electric Co., Ltd.: *See*—
Hara, Michio; Tomimori, Akinobu; and Hara, Hiroshi, 4,394,542, Cl. 179-81.00B.
Sakuma, Hiraku; and Suzuki, Toshiyuki, 4,394,674, Cl. 357-23.000.
Yoshida, Kazunori, 4,394,713, Cl. 361-433.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Wachi, Masatada, 4,393,742, Cl. 84-1.230.
Wachi, Masatada, 4,393,743, Cl. 84-1.230.

Nippon Kogaku K.K.: *See*—
Wakamiya, Koichi, 4,394,073, Cl. 350-465.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, 4,394,559, Cl. 219-125.120.
Tamura, Manabu; Kamemura, Yoshiki; and Handa, Masao, 4,393,677, Cl. 72-97.000.

Nippon Oil and Fats Company, Limited: *See*—
Sawaoka, Akira; Araki, Masatada; Saito, Shinroku; and Akashi, Tamotsu, 4,394,170, Cl. 75-233.000.
Takeuchi, Fumio; and Takahashi, Masao, 4,394,198, Cl. 149-21.000.
Ujikawa, Norihisa; and Fukushi, Kyosuke, 4,394,480, Cl. 525-43.000.

Nippon Piston Ring Co., Ltd.: *See*—
Urano, Shigeru, 4,393,821, Cl. 123-195.00C.

Nippon Seiko Kabushiki Kaisha: *See*—
Tukamoto, Masahiro, 4,393,995, Cl. 242-107.40A.

Nippon Sheet Glass Co. Ltd.: *See*—
Fujioka, Akira; Sakiyama, Kazuo; Takigawa, Akio; and Yoshida, Motoaki, 4,394,177, Cl. 106-287.140.

Nippon Soken, Inc.: *See*—
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,393,702, Cl. 73-204.000.
Nishida, Minoru; Hattori, Tadashi; and Tanaka, Akira, 4,393,850, Cl. 123-536.000.

Nippon Steel Corporation: *See*—
Furukawa, Takashi; and Koyama, Kazuo, 4,394,186, Cl. 148-12.00F.
Harase, Jirou; and Nakayama, Tadashi, 4,394,188, Cl. 148-12.0EA.
Satoh, Shingo; Inoue, Takashi; Naki, Minoru; and Kawauchi, Yuji, 4,394,165, Cl. 75-60.000.

Nippon Telecommunication Engineering Company: *See*—
Asano, Kiyomitsu; Jozuka, Masao; and Kondo, Toshikatsu, 4,394,093, Cl. 400-124.000.

Nippon Telegraph & Telephone Public Corp.: *See*—
Imai, Kazuo, 4,393,577, Cl. 29-576.00B.
Kato, Kotaro; and Sakurai, Tetsuma, 4,393,573, Cl. 29-571.000.

Nippondenso Co., Ltd.: *See*—
Terazawa, Hidehito, 4,394,605, Cl. 318-280.000.

Nishida, Minoru; Hattori, Tadashi; and Tanaka, Akira, to Nippon Soken, Inc. Ignition system for internal combustion engines. 4,393,850, Cl. 123-536.000.

Nishihara, Toshio: *See*—
Yamamoto, Hideomi; Watanabe, Haruzo; Kishie, Hidehiko; and Nishihara, Toshio, 4,394,412, Cl. 428-174.000.

Nishikawa, Masaji; Amemiya, Norio; Yasuda, Tadahiro; and Nakayama, Shigeru, to Olympus Optical Company Limited. Electrophotographic sensitizing screen with peripherally clogged apertures. 4,394,427, Cl. 430-68.000.

Nishikawa, Masaji, to Olympus Optical Company Limited. Method for printing a plurality of duplicated copies from the same electrostatic charge latent image. 4,394,432, Cl. 430-120.000.

Nishimura, Yukuo: *See*—
Ozawa, Masakazu; Watanabe, Kunio; Matsumoto, Shigeyuki; Nishimura, Yukuo; and Miyazaki, Takashi, 4,394,669, Cl. 346-140.00R.

Nishioka, Goro: *See*—
Sakabe, Yukio; and Nishioka, Goro, 4,394,456, Cl. 501-138.000.

Nissan Motor Co., Ltd.: *See*—
Izumi, Masao; Yoshida, Hiroshi; and Yoshikawa, Yukio, 4,393,897, Cl. 137-831.000.
Izumi, Masao; Yoshida, Hiroshi; and Yoshikawa, Yukio, 4,393,898, Cl. 137-831.000.
Kataoka, Ryuji, 4,393,839, Cl. 123-440.000.
Kishida, Katsuhiro; Mekuchi, Yutaka; Hirao, Sumio; and Date, Hirohiko, 4,394,560, Cl. 219-137.0WM.
Sato, Yoshimi, 4,394,035, Cl. 280-804.000.
Sugihara, Kunihiko; and Onoda, Michio, 4,393,837, Cl. 123-425.000.
Suzuki, Kouichi; and Mori, Kazuyuki, 4,394,739, Cl. 364-426.000.
Suzuki, Tadashi; and Kishi, Norimasa, 4,393,732, Cl. 74-866.000.

Nissin Kogyo Kabushiki Kaisha: *See*—
Miyazaki, Yoshihisa, 4,393,749, Cl. 91-376.00R.

Nivin, James E., to American Commercial Barge Line Co. Method of protecting contents of a barge while in transit. 4,393,888, Cl. 114-201.00R.

Nix, Paul T.; Santoro, Janet M.; and Stephens, Joyce E. Enzymatic glyceride hydrolysis. 4,394,445, Cl. 435-19.000.

NL Industries, Inc.: *See*—
Hoff, Michael H., 4,394,273, Cl. 252-8.55R.

NL Sperry Sun, Inc.: *See*—
Powell, Steven W.; and Stockton, James G., 4,393,598, Cl. 33-302.000.

Noguchi, Takeshi: *See*—
Kimura, Tadatomo; and Noguchi, Takeshi, 4,394,596, Cl. 310-184.000.

Nohara, Norimasa: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Murayama, Hideo; Ishimatsu, Kenji; Ogushi, Akira; and Takami, Katsumi, 4,394,576, Cl. 250-366.000.

Nolden, Werner, to American Standard Inc. Tub filling and shower valve. 4,393,523, Cl. 4-192.000.

Nolker, Dieter: *See*—
Maurer, Alexander; Adrian, Renate; Panter, Herbert; Heymer, Gero; and Nolker, Dieter, 4,394,358, Cl. 423-305.000.

Nolte, Kenneth G.; and Smith, Michael B., to Standard Oil Company (Indiana). Determination of maximum fracture pressure. 4,393,933, Cl. 166-250.000.

Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, to Nippon Kokan Kabushiki Kaisha. Arc welding method. 4,394,559, Cl. 219-125.120.

Nomura, Noboru: *See*—
Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, 4,394,699, Cl. 360-113.000.

Nordstjernan AB: *See*—
Samuel, Olof; and Hellemaa, Heikki, 4,393,832, Cl. 123-327.000.

Norgren, Kent S.; and Vogelsberg, Robert E., to International Business Machines Corp. Programmable peripheral processing controller. 4,394,734, Cl. 364-200.000.

Norprint International: *See*—
Figg, Anthony V. J., 4,393,774, Cl. 101-288.000.

Norsk Hydro A.S.: *See*—
Rasmussen, Odd F., 4,393,910, Cl. 150-12.000.

Northern Telecom, Inc.: *See*—
Higuera, Robert S.; and Ryan, John F., 4,394,123, Cl. 432-253.000.

Nouchi, Norimoto: *See*—
Kaminaka, Nobuyuki; Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, 4,394,699, Cl. 360-113.000.

Nowack, Gerhard P.; Johnson, Marvin M.; and Tabler, Donald C., to Phillips Petroleum Company. Hydrogenation catalyst. 4,394,298, Cl. 252-438.000.

Nowack, Gerhard P.: *See*—
Kukes, Semyon; Nowack, Gerhard P.; and Johnson, Marvin M., 4,394,255, Cl. 585-667.000.

Nuez, Jean-Paul J.: *See*—
Grandguillot, Michel J.; Mollier, Pierre B.; and Nuez, Jean-Paul J., 4,394,747, Cl. 365-104.000.

Nuzillat, Gerard: *See*—
Pham, Ngu T.; and Nuzillat, Gerard, 4,394,589, Cl. 307-450.000.

Nygard, James C.; Weiss, Melvin P.; and Larsen, Thomas E., to Minnesota Mining and Manufacturing Company. Apparatus for removing toner from and applying offset preventive liquid to a fixing roller. 4,393,804, Cl. 118-60.000.

Oak Industries Inc.: *See*—
Konicek, Jiri K., 4,394,419, Cl. 428-416.000.
Larson, Willis A., 4,394,547, Cl. 200-5.00A.

Obayashi, Hideki: *See*—
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,393,702, Cl. 73-204.000.

Obermayer, Bertram; Skatsche, Othmar; and Greier, Josef, to List, Hans. Water-cooled, multi-cylinder internal combustion engine. 4,393,822, Cl. 123-195.00R.

O'Boyle, Dolores; and Shonk, Phyllis, to International Playtex, Inc. Brassiere. 4,393,875, Cl. 128-425.000.

Ocean B.V.: *See*—
Snoek, Govert J.; and Tuil, William J., 4,393,891, Cl. 137-238.000.

O'Connell, Daniel J.: *See*—
Gibler, David L.; and O'Connell, Daniel J., 4,393,997, Cl. 244-135.00R.

O'Dell, Leonard J., to Allis-Chalmers Corporation. Protective spark eliminating system for a filter baghouse. 4,394,143, Cl. 55-261.000.

O'Donnell, Brian F. Processing of sea urchins. 4,393,545, Cl. 17-76.000.

O'Dwyer, Micheal: *See*—
Yeomans, David; Wilkinson, Christopher J.; McCartney, Damien; and O'Dwyer, Micheal, 4,394,685, Cl. 358-264.000.

Oelke, Erwin S., to Smith International, Inc. High-speed seal. 4,394,020, Cl. 277-1.000.

Oertle, Donald H.: *See*—
Peterson, Marvin L.; Hein, Norman W., Jr.; and Oertle, Donald H., 4,394,577, Cl. 250-372.000.

Office National d'Etudes et de Recherches Aerospatiales: *See*—
Bernard, Alain M., 4,393,710, Cl. 73-517.00B.

Ogasa, Tatsuo, to Agency of Industrial Science & Technology. Porous composite material and process for preparing same. 4,394,457, Cl. 521-54.000.

Ogushi, Akira: *See*—
Tanaka, Eiichi; Nohara, Norimasa; Murayama, Hideo; Ishimatsu, Kenji; Ogushi, Akira; and Takami, Katsumi, 4,394,576, Cl. 250-366.000.

Ohkura, Makoto: *See*—
Wada, Yasuo; Usui, Hiroo; Ohkura, Makoto; Miyao, Masanobu; Tamura, Masao; and Tokuyama, Takashi, 4,394,191, Cl. 148-33.100.

Ohta, Hiroaki: *See*—
Tarumi, Noriyoshi; Tsuchiya, Hiroshi; Kokiso, Masakazu; and Ohta, Hiroaki, 4,394,340, Cl. 264-219.000.

Ohta, Masayuki: *See*—
Okamoto, Tadaomi; Ohta, Masayuki; and Watanabe, Makoto, 4,394,772, Cl. 378-182.000.

Ohtani, Hiroo; and Watanabe, Seiichi, to Sumitomo Metal Industries, Ltd. Method of making steels which are useful in fabricating pressure vessels. 4,394,187, Cl. 148-12.00F.

Oka, Masahisa: *See*—
Kamachi, Hajime; Okumura, Jun; Naito, Takayuki; and Oka, Masahisa, 4,394,503, Cl. 544-25.000.

Okabe, Yousuke; and Shoji, Osamu, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor. 4,394,331, Cl. 261-18.00B.

Okamoto Manufacturing Co., Ltd.: *See*—
Okamoto, Tadaomi; Ohta, Masayuki; and Watanabe, Makoto, 4,394,772, Cl. 378-182.000.

Okamoto, Tadaomi; Ohta, Masayuki; and Watanabe, Makoto, to Okamoto Manufacturing Co., Ltd. Radiographic cassette. 4,394,772, Cl. 378-182.000.

Okumoto, Kiyohumi: *See*—
Hashimoto, Takeji; Okumoto, Kiyohumi; and Andoh, Masayasu, 4,393,670, Cl. 66-75.200.

Okumura, Jun: *See*—
Kamachi, Hajime; Okumura, Jun; Naito, Takayuki; and Oka, Masahisa, 4,394,503, Cl. 544-25.000.

Okuyama, Kazuo: *See*—
Miyake, Tetsuya; Takeda, Kunihiko; Onitsuka, Hatsuki; Okuyama, Kazuo; and Shimamura, Yasuki, 4,394,353, Cl. 423-21.500.

Olah, George A. Liquefaction of coals using recyclable superacid catalyst. 4,394,247, Cl. 208-10.000.

Oliapuram, Antony: *See*—
von Alpen, Ulrich; Brautigam, Reinhard; and Oliapuram, Antony, 4,394,280, Cl. 252-62.200.

Olin Corporation: *See*—
Gray, Thomas J., 4,394,228, Cl. 204-98.000.

Olmr, Jaroslav J., to Textron, Inc. Top sharpening chain. 4,393,739, Cl. 83-834.000.

Olsen, Charles R. Revolving firearms and ammunition therefor. 4,393,782, Cl. 102-446.000.

Olson, Carl G. Web securing device. 4,393,915, Cl. 160-395.000.

Olson, Donald L., to Tennant Company. Scrubber with foam and spray suppressor. 4,393,538, Cl. 15-320.000.

Oltmanns, Roger W., Jr.; and Portolese, Larry A., to Bendix Corporation, The. Disc brake caliper support. 4,393,963, Cl. 188-73.450.

Olympus Optical Company Ltd.: *See*—
Mizokami, Kazunori, 4,394,570, Cl. 250-209.000.
Nishikawa, Masaji; Amemiya, Norio; Yasuda, Tadahiro; and Nakayama, Shigeru, 4,394,427, Cl. 430-68.000.
Nishikawa, Masaji, 4,394,432, Cl. 430-120.000.

Omichi, Takeo: *See*—
Shima, Michitsune; Kihara, Shiso; Omichi, Takeo; Igarashi, Taeji; and Mangetsu, Kenji, 4,393,920, Cl. 165-11.00A.

Onitsuka, Hatsuki: *See*—
Miyake, Tetsuya; Takeda, Kunihiko; Onitsuka, Hatsuki; Okuyama, Kazuo; and Shimamura, Yasuki, 4,394,353, Cl. 423-21.500.

Ono, Yoshihiro: *See*—
Kawaguchi, Hideo; Inayama, Takayuki; Takimoto, Masaaki; and Ono, Yoshihiro, 4,394,441, Cl. 430-524.000.

Onoda, Michio: *See*—
Sugihara, Kunihiko; and Onoda, Michio, 4,393,837, Cl. 123-425.000.

Onoda, Tadayuki: *See*—
Maruyama, Teruo; Onoda, Tadayuki; and Taguchi, Tatsuhisa, 4,394,114, Cl. 418-269.000.

Ophir Corporation: *See*—
Nelson, Loren D., 4,394,575, Cl. 250-343.000.

Oppenheimer, Carl P.: *See*—
Niezgoda, Thomas A.; and Oppenheimer, Carl P., 4,393,740, Cl. 84-1.010.

Optimetrix Corporation: *See*—
Phillips, Edward H., 4,393,727, Cl. 74-209.000.

Orbanes, Philip; and Cooper, Julius, to Ideal Toy Corporation. Electronic logic game. 4,394,018, Cl. 273-237.000.

Orobin, Edwin H. Collapsible tent frame. 4,393,887, Cl. 135-109.000.

Osmera, Miroslav S.; and Brooks, Ralf M., to NCR Canada Ltd. - NCR Canada Ltee. Method and apparatus for high speed thermal printing. 4,394,092, Cl. 400-120.000.

Osrow, Harold; and Araujo, Armando A., to Osrow Products Company, Inc. Disposable foil broiling sheet. 4,394,410, Cl. 428-43.000.

Osrow Products Company, Inc.: *See*—
Osrow, Harold; and Araujo, Armando A., 4,394,410, Cl. 428-43.000.

Osterholm, Jewell L., to Thomas Jefferson University. Extravascular circulation of oxygenated synthetic nutrients to treat tissue hypoxic and ischemic disorders. 4,393,863, Cl. 128-1.00R.

Otake, Mituyoshi: *See*—
Suzuki, Yoshihisa; Kaizuka, Takaoki; Hanya, Yoshiaki; Otake, Mituyoshi; and Hidano, Yoichi, 4,394,404, Cl. 427-48.000.

Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, to Honda Motor Co., Ltd. Air/fuel ratio control system for internal combustion engines, having atmospheric pressure compensating function. 4,393,842, Cl. 123-440.000.

Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, to Honda Motor Co., Ltd. Air-fuel ratio feedback control system for internal combustion engines, having function of correcting position of air/fuel ratio control valve actuator. 4,393,843, Cl. 123-440.000.

Otsuka, Kazutoshi: *See*—
Tanaka, Hideki; and Otsuka, Kazutoshi, 4,393,840, Cl. 123-440.000.

Otsuki, Yoichi: *See*—
Furukawa, Hideo; Chikugo, Kazuo; and Otsuki, Yoichi, 4,393,823, Cl. 123-196.00M.

Ottman, John C.; and Shen, John C. S., to International Business Machines Corporation. Fixed abrasive polishing method and apparatus. 4,393,628, Cl. 51-281.0SF.

Oudenhoven, Martin S., to United States of America, Interior. Method of hydrospalling. 4,394,051, Cl. 299-16.000.

Outboard Marine Corporation: *See*—
Poehlman, Arthur G., 4,393,848, Cl. 123-525.000.

Outokumpu Oy: *See*—
Makinen, Juho K.; and Kaenniemi, Kaarina M. E., 4,394,164, Cl. 75-21.000.

Overlach, Knud: *See*—
Pietzsch, Ludwig; Overlach, Knud; and Wamser, Manfred, 4,393,698, Cl. 73-118.000.

Owen, Wickersham & Erickson: *See*—
Lindberg, John E., 4,393,817, Cl. 123-3.000.

Owens-Corning Fiberglas Corporation: *See*—
Grossi, Anthony V.; Hagelee, Leon A.; Hahn, Louis T.; and Marzocchi, Alfred, 4,394,481, Cl. 525-54.500.
Uffner, William E., 4,394,482, Cl. 525-54.500.

Owens-Illinois, Inc.: *See*—
Ryan, William H., 4,394,148, Cl. 65-159.000.
Willingham, Wendell D., 4,393,977, Cl. 215-211.000.

Owens, Kenneth B.: *See*—
Dilgren, Richard E.; and Owens, Kenneth B., 4,393,937, Cl. 166-272.000.

Oy Warstsila AB: *See*—
Samuel, Olof; and Hellemaa, Heikki, 4,393,832, Cl. 123-327.000.

Ozawa, Masakazu; Watanabe, Kunio; Matsumoto, Shigeyuki; Nishimura, Yukuo; and Miyazaki, Takashi, to Canon Kabushiki Kaisha. Liquid jet recording apparatus. 4,394,669, Cl. 346-140.00R.

P.L.G. Research Limited: *See*—
Mercer, Frank B., 4,394,342, Cl. 264-292.000.

Pako Corporation: *See*—
Simning, Robert A.; and Schultz, Michael E., 4,394,094, Cl. 400-124.000.

Palmer, Bryan H.: *See*—
Copping, Leonard G.; Kerry, John C.; Watkins, Thomas I.; Willis, Robert J.; and Palmer, Bryan H., 4,394,387, Cl. 424-300.000.

Palomar Systems & Machines, Inc.: *See*—
Braden, Denver, 4,393,808, Cl. 118-503.000.

Panter, Herbert: *See—*
Maurer, Alexander; Adrian, Renate; Panter, Herbert; Heymer, Gero; and Nolker, Dieter, 4,394,358, Cl. 423-305.000.

Pantzar, Glenn G. E., to Santrade Ltd. Saw guide bar. 4,393,590, Cl. 30-387.000.

Papahadjopoulos, Demetrios P.: *See—*
Szoka, Francis C., Jr.; and Papahadjopoulos, Demetrios P., 4,394,149, Cl. 71-28.000.
Szoka, Francis C., Jr.; and Papahadjopoulos, Demetrios P., 4,394,448, Cl. 435-172.000.

Pape, Heinz; Quella, Ferdinand; and Krueger, Hans, to Siemens Aktiengesellschaft. Fluorescently activated display device with improved sensitivity. 4,394,068, Cl. 350-345.000.

Papst-MOTOREN KG: *See—*
Schmider, Fritz; and Muller, Rolf, 4,394,594, Cl. 310-68.00R.

Parfitt, Rick: *See—*
Warren, Ben; White, George M.; Parfitt, Rick; and Deng, Peter, 4,394,538, Cl. 179-1.0SD.

Park, Chan H.: *See—*
Galkin, Benjamin M.; Boon, Raymond; Gilliam, Rudolph V.; and Park, Chan H., 4,393,864, Cl. 128-1.100.

Park, Sang-Woo, to Korea Advanced Institute of Science and Technology, The. Process for preparing ethyl α-chloroethyl carbonate. 4,394,233, Cl. 204-158.0HA.

Parker Hannifin Corporation: *See—*
Sharp, Bernard C., 4,394,066, Cl. 350-307.000.

Pataki, Andrew B., to Sperry Corporation. Long stroke linear actuator. 4,394,592, Cl. 310-12.000.

Patry, Jean. Melting latent-heat heat or cold exchanger-storage device. 4,393,918, Cl. 165-10.000.

Pavlic, John C., to C-Cor Electronics, Inc. Radio frequency choke and method of use. 4,394,631, Cl. 333-132.000.

Payer, Wolfgang: *See—*
Hobes, Victor J.; and Payer, Wolfgang, 4,394,483, Cl. 525-60.000.

Pearson, Stephen, to Baxter Travenol Laboratories, Inc. Universal administration port. 4,393,909, Cl. 150-8.000.

Pebler, Alfred R., to Westinghouse Electric Corp. Combined sulfur oxide/oxygen measuring apparatus. 4,394,240, Cl. 204-412.000.

Peck, Robert E.; and Zagranski, Raymond D., to Chandler Evans Inc. Fuel control method and apparatus. 4,393,651, Cl. 60-39.281.

Pecor Corporation: *See—*
Damerau, Herbert R., 4,394,272, Cl. 210-779.000.

Pedersen, Niels R.; and Nielsen, Eyvind S. Heating plant. 4,393,815, Cl. 122-31.00R.

Peemoller, Horst: *See—*
Weiss, Hermann; Klotz, Erhard; Peemoller, Horst; Linde, Rolf; and Mauser, Wilfried, 4,394,063, Cl. 350-162.130.

Peeters, Hugo K., to Agfa-Gevaert, N.V. Recording material for storage of digital information and a recording method for storage of digital information. 4,394,661, Cl. 346-1.100.

Peisel, William E.: *See—*
Long, Nicholas R.; Peisel, William E.; Ryan, Joseph L.; and Watkins, Richard R., 4,394,650, Cl. 340-728.000.

Pelly, L. Ronald. Shape memory element engine. 4,393,654, Cl. 60-527.000.

Pelta, Edmond R.: *See—*
Crummer, Marvin R.; Gold, Kenneth S.; Johnson, David G.; Vandermeyden, Tom R.; and Pelta, Edmond R., 4,394,742, Cl. 364-487.000.

Penn Engineering & Manufacturing Corp.: *See—*
Hansen, David M.; and Ernest, Richard B., 4,393,684, Cl. 72-451.000.

Pennebaker, William B.: *See—*
Landon, Alfred J.; Pennebaker, William B.; and Wang, Han C., 4,393,769, Cl. 101-93.300.

Penner, Horst: *See—*
Brede, Uwe; and Penner, Horst, 4,393,779, Cl. 102-202.500.

Pennino, Frank L.: *See—*
Kuenzig, Ernest O.; and Pennino, Frank L., 4,394,116, Cl. 425-192.00R.

Pennwalt Corporation: *See—*
Adams, Richard G., 4,394,184, Cl. 148-6.15R.

Penzel, Hans-Joerg, to Siemens Aktiengesellschaft. Integrated memory module having selectable operating functions. 4,394,753, Cl. 365-236.000.

Pereira, Dennis: *See—*
Weissman, Sherman M.; Pereira, Dennis; and Sood, Ashwani, 4,394,443, Cl. 435-6.000.

Pereyre, Michel; and Pommier, Jean-Claude, to Societe Nationale Elf Aquitaine. Synthesis of stannic tetra mercaptides. 4,394,320, Cl. 260-429.700.

Perlstein, Jerome H.: *See—*
Van Allan, James A.; Perlstein, Jerome H.; Reynolds, George A.; and Goliber, Thomas E., 4,394,428, Cl. 430-83.000.

Perrien, Frank A. Wire splicing tool. 4,393,905, Cl. 140-118.000.

Perrone, Francesco: *See—*
De Angelis, Giancarlo; Catastini, Alberto; Bassi, Aldo; Rogora, Edoardo; Radaelli, Dario; Bertoloni, Luciano; and Perrone, Francesco, 4,393,836, Cl. 123-417.000.

Perry, Thomas J.: *See—*
Comfort, Joseph A.; Perry, Thomas J.; and Loos, Michel, 4,394,728, Cl. 364-200.000.

Persson, Arne. Feeding device. 4,393,609, Cl. 37-238.000.

Pertsch, Heinrich: *See—*
Ertl, Wilhelm; Lachmann, Ulrich; and Pertsch, Heinrich, 4,394,190, Cl. 148-31.550.

Petersen, Wallace C., to Du Pont de Nemours, E. I., and Company. Process of preparing aromatic aldehydes by reacting selected aromatic compounds with formamidine acetate and an organic acid anhydride. 4,394,314, Cl. 260-391.000.

Peterson Associates, Ltd.: *See—*
Peterson, Carl R., 4,393,949, Cl. 175-377.000.

Peterson, Carl R., to Peterson Associates, Ltd. Rock boring apparatus. 4,393,949, Cl. 175-377.000.

Peterson, Jerald G. Measuring device. 4,393,601, Cl. 33-494.000.

Peterson, Joe W.: *See—*
McKenzie, James A.; and Peterson, Joe W., 4,394,587, Cl. 307-355.000.

Peterson, Marvin L.; Hein, Norman W., Jr.; and Oertle, Donald H., to Conoco Inc. Displacement measurement device and method. 4,394,577, Cl. 250-372.000.

Petroons, Jose O. G., to U.S. Philips Corporation. Wound bobbin coil apparatus. 4,394,637, Cl. 336-192.000.

Peuser, Michael F.; and Bartolo, Jose B. Recuperation of cyanides from rinsing solutions of cyanidric processes for eletrodeposition of metals. 4,394,356, Cl. 423-43.000.

Pezzei, Friedbert: *See—*
Aste, Christian, 4,394,173, Cl. 104-69.000.

Pfeiffer, Ronald E.; and DeMaria, Francesco, to American Cyanamid Company. Process for preparing open structure fibers. 4,394,339, Cl. 264-177.00F.

Pfeil, Janice L.: *See—*
Kukolja, Stjepan; and Pfeil, Janice L., 4,394,313, Cl. 260-245.400.

Pfoh, Rolf: *See—*
Bickle, Wolfgang: Funke, Rolf; and Pfoh, Rolf, 4,394,275, Cl. 252-12.000.

Pham, Ngu T.; and Nuzillat, Gerard, to Thomson-CSF. Logic circuit including at least one resistor or one transistor having a saturable resistor field effect transistor structure. 4,394,589, Cl. 307-450.000.

Phelps Dodge Industries, Inc.: *See—*
Hilker, George D., 4,393,809, Cl. 118-620.000.
Hilker, George D., 4,394,417, Cl. 428-383.000.

Phillips, Edward H., to Optimetrix Corporation. Friction drive. 4,393,727, Cl. 74-209.000.

Phillips Petroleum Company: *See—*
Casperson, John R., 4,393,603, Cl. 34-39.000.
Cheng, Paul J., 4,394,350, Cl. 422-150.000.
Gardner, Lloyd E., 4,394,301, Cl. 252-455.00Z.
Hawley, Gil R., 4,394,291, Cl. 252-429.00B.
Kolts, John H., 4,394,297, Cl. 252-437.000.
Kukes, Semyon; Nowack, Gerhard P.; and Johnson, Marvin M., 4,394,255, Cl. 585-667.000.
Lowery, Richard E.; Gordon, Bruce W.; and Steger, Barry N., 4,394,323, Cl. 260-446.000.
Mark, Harold W.; Bertus, Brent J.; and Roberts, John S., 4,394,324, Cl. 260-446.000.
Nowack, Gerhard P.; Johnson, Marvin M.; and Tabler, Donald C., 4,394,298, Cl. 252-438.000.

Phillips Plastics Corp.: *See—*
Wollar, Burnell J.; and Schwind, Richard J., 4,393,551, Cl. 24-213.00R.

Phillips Temro, Inc.: *See—*
Gorans, Marc S., 4,393,851, Cl. 123-557.000.

Picard, Jean-Francois; and Jacquard, Paul, to Societe D'Applications Generales. Stabilized sighting devices for vehicles. 4,393,597, Cl. 33-275.00G.

Pickett, Fred E. Gun rest. 4,393,614, Cl. 42-94.000.

Pierre Guerin S.A.: *See—*
Quilliou, Guy, 4,393,759, Cl. 99-459.000.

Pietzsch, Ludwig; Overlach, Knud; and Wamser, Manfred, to Pietzsch, Ludwig. Device for measuring hollow cylinder surfaces. 4,393,698, Cl. 73-118.000.

Pissiotas, Georg; and Rempfler, Hermann, to Ciba-Geigy Corporation. Pyridyl-2-oxyphenyloxime derivatives and their use as herbicides. 4,394,157, Cl. 71-94.000.

Pissiotas, Georg; and Rempfler, Hermann, to Ciba-Geigy Corporation. Pyridyl-2-oxyphenyloxime derivatives, and their use as herbicides. 4,394,158, Cl. 71-94.000.

Pissiotas, Georg: *See—*
Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Burdeska, Kurt, 4,394,327, Cl. 260-455.00R.

Pisters, Michael G. H.: *See—*
Werner, Marcel A.; Venema, Arnold; and Pisters, Michael G. H., 4,394,470, Cl. 524-56.000.

Pitney Bowes Inc.: *See—*
Mol, Hans C.; and Byrne, LeRoy H., 4,393,894, Cl. 137-454.000.

Pizzi, Giacomo: *See—*
Camerini, Mario; and Pizzi, Giacomo, 4,394,104, Cl. 414-276.000.

Plant, Howard L.; Cantor, Steven E.; Doweyko, Arthur M.; Dekeyser, Mark A.; and Bell, Allyn R., to Uniroyal, Inc.; and Uniroyal Ltd. Substituted pyridine 1-oxide herbicides. 4,394,155, Cl. 71-94.000.

Plasma Holdings N.V.: *See—*
Tylko, Jozef K., 4,394,162, Cl. 75-10.00R.

Plattner, Eric: *See—*
Jager, Horst; Plattner, Eric; Bersier, Jacques; and Comninellis, Christos, 4,394,227, Cl. 204-73.00R.

Plessers, Hendrik S.; and Hellemans, Julianus J., to Agfa-Gevaert N.V. Sheet receiving and storage apparatus. 4,393,642, Cl. 53-266.00R.

Pociluyko, Alex, to Scott Paper Company. Bleed-fast cationic dyestuffs. 4,394,212, Cl. 162-162.000.

Podszun, Wolfgang; Walkowiak, Michael; and Schulz, Hans-Hermann, to Bayer Aktiengesellschaft. Dental materials based on organic plastics in paste form. 4,394,465, Cl. 523-116.000.
Poehlman, Arthur G., to Outboard Marine Corporation. Control mechanism for selectively operating an internal combustion engine on two fuels. 4,393,848, Cl. 123-525.000.
Pohoreski, Anton P.: *See*—
Strunk, Norman E.; and Pohoreski, Anton P., 4,393,992, Cl. 239-200.000.
Policastro, Steven G.; and Woo, Dae-Shik, to RCA Corporation. Method of making low leakage N-channel SOS transistors utilizing positive photoresist masking techniques. 4,393,572, Cl. 29-571.000.
Polley, Richard B., to ACF Industries, Incorporated. Mounting flange for wafersphere bottom outlet valve. 4,394,002, Cl. 251-144.000.
Polony, Rudolf: *See*—
Holzle, Gerd; Reinert, Gerhard; and Polony, Rudolf, 4,394,125, Cl. 8-103.000.
Polva Nederland B.V.: *See*—
Acda, Petrus M.; and Karreman, Jacob, 4,394,343, Cl. 264-296.000.
Polymer Corporation, The: *See*—
Blachman, Lawrence P., 4,394,705, Cl. 361-215.000.
Polymer Technology Corporation: *See*—
Ellis, Edward J.; and Salamone, Joseph C., 4,394,179, Cl. 134-7.000.
Polysar Limited: *See*—
Kim, Chan J.; and Koski, Ahti A., 4,394,488, Cl. 524-432.000.
Polyvend Inc.: *See*—
Strack, Martin P., Jr., 4,393,970, Cl. 194-17.000.
Pommier, Jean-Claude: *See*—
Pereyre, Michel; and Pommier, Jean-Claude, 4,394,320, Cl. 260-429.700.
Pool, Francis C., to Rolls-Royce Limited. Gas turbine engine having an automatic ice shedding spinner. 4,393,650, Cl. 60-39.093.
Popper, Jay: *See*—
Burstein, Steve; and Popper, Jay, 4,394,751, Cl. 365-227.000.
Porst, Hannsheinz: *See*—
Hofmann-Cerfontaine, Hellmut W., 4,394,654, Cl. 340-825.340.
Portolese, Larry A.: *See*—
Oltmanns, Roger W., Jr.; and Portolese, Larry A., 4,393,963, Cl. 188-73.450.
Potoski, John R.: *See*—
Commons, Thomas J.; and Potoski, John R., 4,394,504, Cl. 544-28.000.
Pottier, Alain; Chesnel, Pierre; and Chaintreau, Bernard, to Schlumberger Technology Corporation. Well perforating apparatus. 4,393,946, Cl. 175-4.560.
Powell, Steven W.; and Stockton, James G., to NL Sperry Sun, Inc. Borehole tool. 4,393,598, Cl. 33-302.000.
PPG Industries, Inc.: *See*—
Barter, James A.; and Kellar, David E., 4,394,328, Cl. 260-463.000.
Brown, Daniel G.; and Motsinger, Donald L., 4,394,414, Cl. 428-288.000.
Dauson, Samuel, 4,394,064, Cl. 350-259.000.
Korach, Malcolm, 4,394,229, Cl. 204-98.000.
Temple, Chester S., 4,394,418, Cl. 428-391.000.
Temple, Chester S.; and Hsu, Ed C., 4,394,475, Cl. 524-262.000.
Pracht, Hans: *See*—
Bergmann, Horst; and Pracht, Hans, 4,393,831, Cl. 123-323.000.
Press, Jack J. Contour-adaptive atmospheric heat exchange apparatus. 4,393,923, Cl. 165-46.000.
Primas, Willi: *See*—
Huber, Peter; August, Peter; Lampelzammer, Helga; and Primas, Willi, 4,394,518, Cl. 556-424.000.
Prince, Terry B.: *See*—
Doyle, Francis S.; Prince, Terry B.; and Stevenson, Martin J., 4,394,545, Cl. 179-179.000.
Pritula, Nina A.: *See*—
Gryaznov, Vladimir M.; Smirnov, Viktor S.; Vdovin, Valentin M.; Ermilova, Margarita M.; Gogua, Liya D.; Pritula, Nina A.; and Fedorova, Galina K., 4,394,294, Cl. 252-430.000.
Procter & Gamble Company, The: *See*—
Fryar, Durward; and Schmitz, Jerome J., 4,393,643, Cl. 53-471.000.
Gosselink, Eugene P., 4,394,305, Cl. 252-528.000.
Taylor, James L., 4,394,372, Cl. 424-85.000.
Produits Chimiques Ugine Kuhlmann: *See*—
Commeyras, Auguste; and Calas, Patrick, 4,394,225, Cl. 204-59.00R.
Progressive Dynamics, Inc.: *See*—
Crafts, Daniel J., 4,394,706, Cl. 361-331.000.
Prosdocimo, Luciano. Process for producing connecting member shanks, such as hinges for window and door frames, formed of cylindrical sections of different diameter, with continuous even screw thread, that is with constant pitch. 4,393,676, Cl. 72-92.000.
Pryor, Alvetta, to Dow Chemical Company, The. Stabilized methylchloroform composition. 4,394,284, Cl. 252-153.000.
Pryor, Timothy R.: *See*—
Liptay-Wagner, Nicholas; Renaud, Roland; Pryor, Timothy R.; and Clarke, Donald A., 4,394,683, Cl. 358-107.000.
Puharich, Henry K. Method and apparatus for splitting water molecules. 4,394,230, Cl. 204-129.000.
Punko, Emil M.: *See*—
Mazur, Michael B.; and Punko, Emil M., 4,393,960, Cl. 188-62.000.
Pusineri, Christian; and Goletto, Jean, to Hospal-Sodip, S.A. Mixtures of polymers for medical use. 4,394,462, Cl. 521-137.000.
Puskas, Imre; and James, David E., to Standard Oil Company (Indiana). Palladium-rhodium catalyst for purification of crude terephthalic acid. 4,394,299, Cl. 252-447.000.
Putman, William A.: *See*—
Caddy, John A.; and Putman, William A., 4,394,147, Cl. 55-357.000.
PVBA Van Mullem: *See*—
Van Mullem, Albert, 4,393,955, Cl. 180-291.000.
Quaker Oats Company, The: *See*—
Keyser, William L.; and Kinney, Diane S., 4,394,399, Cl. 426-658.000.
Quella, Ferdinand: *See*—
Pape, Heinz; Quella, Ferdinand; and Krueger, Hans, 4,394,068, Cl. 350-345.000.
Quick, Thomas E.: *See*—
Frees, Kenneth A.; and Quick, Thomas E., 4,394,106, Cl. 414-622.000.
Quigley, Herbert J., Jr.: *See*—
Malette, William G.; and Quigley, Herbert J., Jr., 4,394,373, Cl. 424-95.000.
Quilliou, Guy, to Pierre Guerin S.A. Cheese making apparatus. 4,393,759, Cl. 99-459.000.
R. Stahl GmbH & Co., Firma: *See*—
Hortnagel, Franz, 4,393,785, Cl. 104-110.000.
R. W. Hartnett Company: *See*—
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,393,973, Cl. 198-384.000.
Rabette, Jean, to Societe Vandeputte Fils & Cie, S.A. Data display system. 4,394,652, Cl. 340-764.000.
Rabinowitz, Mario: *See*—
Bahder, George; and Rabinowitz, Mario, 4,394,534, Cl. 174-15.005.
Radaelli, Dario: *See*—
De Angelis, Giancarlo; Catastini, Alberto; Bassi, Aldo; Rogora, Edoardo; Radaelli, Dario; Bertoloni, Luciano; and Perrone, Francesco, 4,393,836, Cl. 123-417.000.
Radtke, Richard R.: *See*—
Willis, Frederick G.; Radtke, Richard R.; Ellison, Joseph; and Fozo, Steven R., 4,393,696, Cl. 73-117.300.
Raj Technology Partnership: *See*—
Sandhu, Jaswinder S., 4,393,712, Cl. 73-603.000.
Raman, Ramaswamy V.; and Carbonara, Robert S., to Battelle Memorial Institute. Crucibleless preparation of rapidly solidified fine particulates. 4,394,332, Cl. 264-8.000.
Rambousek, Miroslav; and Svarc, Stanislav, to Elitex, koncern textilniho strojirenstvi. Fiber-guiding element for open end spinning machines. 4,393,648, Cl. 57-413.000.
Ramey, Robert M., to Teledyne Industries, Inc. Method of controlling non-solar swimming pool heater. 4,393,527, Cl. 4-493.000.
Ranbom, Wayne, to FMC Corporation. Hydrogen peroxide process. 4,394,369, Cl. 423-588.000.
Randall Industries, Inc.: *See*—
Larsen, James E.; and Rogers, Charles E., 4,394,013, Cl. 273-1.50R.
Randall, John R., to McDonnell Douglas Corporation. Unidirectional detent gate. 4,393,730, Cl. 74-538.000.
Randmae, Rein S.; and Whitaker, Todd H., to Vicon Industries, Inc. Housing assembly for an electrical apparatus. 4,394,692, Cl. 358-229.000.
Rank Xerox Limited: *See*—
Sugiyama, Mitsuhiko, 4,394,008, Cl. 271-9.000.
Rasmussen, Odd F., to Norsk Hydro A.S. Flexible container having four lifting loops. 4,393,910, Cl. 150-12.000.
Rasmussen, Robert, to Air-Mo Hydraulics, Inc. Hydraulic chuck device for engagement with the inside of a tube. 4,393,674, Cl. 72-61.000.
Rassieur, Charles L., to Central Mine Equipment Company. Rotary drill with a kelly bar and hydraulic chuck. 4,393,945, Cl. 173-163.000.
Rastogi, Prabhat K., to Inland Steel Company. Method for producing low silicon steel electrical lamination strip. 4,394,192, Cl. 148-120.000.
Ratigalas, Max, to Thomson-CSF. Method and device for coding binary data and a device decoding coded data. 4,394,641, Cl. 340-347.0DD.
Rattlingourd, Glen D.: *See*—
Currie, Robert J.; Rattlingourd, Glen D.; Spencer, Billie M.; and Zscheile, John W., Jr., 4,394,642, Cl. 340-347.0DD.
Rausch, John J.: *See*—
Van Thyne, Ray J.; and Rausch, John J., 4,394,422, Cl. 428-592.000.
Ravey, Manny, to IMI (Tami) Institute for Research & Development Ltd. Bromine containing fire retardant compositions of matter. 4,394,306, Cl. 252-609.000.
Ray, Otis E. Novelty written message device suitable for mailing. 4,393,618, Cl. 46-35.000.
Raytheon Company: *See*—
Banks, Donald S., 4,394,628, Cl. 332-19.000.
RCA Corporation: *See*—
Bingham, Joseph P.; and Benford, John F., 4,394,535, Cl. 179-1.0GP.
Gounder, Raj N., 4,394,529, Cl. 136-245.000.
Hawrylo, Frank Z., 4,394,679, Cl. 357-81.000.
Kumar, Mahesh; Menna, Raymond J.; and Huang, Ho-Chung, 4,394,629, Cl. 333-109.000.
Nero, Leroy W., 4,394,722, Cl. 363-68.000.
Policastro, Steven G.; and Woo, Dae-Shik, 4,393,572, Cl. 29-571.000.
Wierschke, Donald J., 4,394,341, Cl. 264-225.000.
Reade, Richard: *See*—
Cook, Richard J.; and Reade, Richard, 4,394,108, Cl. 414-680.000.
Reap, James J., to Du Pont de Nemours, E. I., and Company. Herbicidal aryl esters of N-[(heterocyclic)-aminocarbonyl]sulfamic acid. 4,394,153, Cl. 71-92.000.

Rees, James D., to Xerox Corporation. Imaging system for a multi-magnification copier utilizing gradient index lens array. 4,394,083, Cl. 355-1.000.
Reftech Limited: *See*—
Dutfield, James H., 4,393,767, Cl. 100-229.00A.
Regie Nationale Des Usines Renault: *See*—
Lombard, Claude, 4,393,715, Cl. 73-728.000.
Reid, John H. Conversion of plug flow and complete mix aeration basins to barrier oxidation ditches. 4,394,268, Cl. 210-628.000.
Reid, Kenneth H.: *See*—
Murphy, James E.; and Reid, Kenneth H., 4,394,034, Cl. 280-801.000.
Reifers, Richard F.: *See*—
Bixler, Kenneth D.; Lord, Henry A.; and Reifers, Richard F., 4,394,214, Cl. 162-228.000.
Reiff, Harro: *See*—
Frick, Georg; Reiff, Harro; and Kirsch, Alois, 4,393,570, Cl. 29-560.000.
Reimpell, Uwe; Grof, Helmut; Knell, Franz-Georg; and Wamser, Anton, to Leybold-Heraeus GmbH. Electro-slag remelting furnace for consumable electrodes and having an electrode drive. 4,394,765, Cl. 373-52.000.
Reinert, Gerhard: *See*—
Holzle, Gerd; Reinert, Gerhard; and Polony, Rudolf, 4,394,125, Cl. 8-103.000.
Reinstein, Martine; and Wurcel, Jacques. Jewelry articles. 4,393,667, Cl. 63-29.00R.
Rempfler, Hermann: *See*—
Pissiotas, Georg; and Rempfler, Hermann, 4,394,157, Cl. 71-94.000.
Pissiotas, Georg; and Rempfler, Hermann, 4,394,158, Cl. 71-94.000.
Renaud, Roland: *See*—
Liptay-Wagner, Nicholas; Renaud, Roland; Pryor, Timothy R.; and Clarke, Donald A., 4,394,683, Cl. 358-107.000.
Renon, Henri; and Richon, Dominique, to Institut Francais du Petrole; and Association pour la Recherche et le Developpment. Device for determining physical characteristics of a fluid, such as its liquid-vapor equilibrium pressure. 4,393,689, Cl. 73-64.200.
Repa Feinstanzwerk GmbH: *See*—
Fohl, 4,393,555, Cl. 24-230.00A.
Wier, Franz, 4,393,553, Cl. 24-230.0AL.
Wier, Franz, 4,393,554, Cl. 24-230.0AL.
Reprogle, Layton J.; and Reprogle, Truman B., to All Temp Engineering Inc. Power broom with auger and vacuum debris conveyor. 4,393,537, Cl. 15-348.000.
Reprogle, Truman B.: *See*—
Reprogle, Layton J.; and Reprogle, Truman B., 4,393,537, Cl. 15-348.000.
Research Corporation: *See*—
Carpino, Louis A.; and Cohen, Beri, 4,394,519, Cl. 560-32.000.
Groves, William N., 4,393,853, Cl. 123-568.000.
Research Foundation of the City University of New York: *See*—
Lowen, Gerard G.; and Tricamo, Stephen J., 4,393,690, Cl. 73-66.000.
Revis, Doyle A. Balanced heat exchange assembly. 4,393,666, Cl. 62-506.000.
Revitz, Martin: *See*—
Gardiner, James R; Makarewicz, Stanley R.; Revitz, Martin; and Shepard, Joseph F., 4,394,406, Cl. 427-86.000.
Reynolds, Blake: *See*—
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,394,137, Cl. 48-197.00R.
Reynolds, Charles E., to AMP Incorporated. Connector of a type used with dry cell batteries and manufacturing method. 4,394,059, Cl. 339-125.00R.
Reynolds, George A.: *See*—
Van Allan, James A.; Perlstein, Jerome H.; Reynolds, George A.; and Goliber, Thomas E., 4,394,428, Cl. 430-83.000.
Reynolds Metals Company: *See*—
Hutcheson, James L., 4,394,204, Cl. 156-275.100.
Reznik, Benjamin; Welber, Stanley; and Streifeneder, Ludwig, to Eder Instrument Co., Inc. Aspirating surgical forceps. 4,393,872, Cl. 604-151.000.
Rheinmetall GmbH: *See*—
Graf, Manfred, 4,393,781, Cl. 102-440.000.
Rhone-Poulenc-Textile: *See*—
Grosjean, Pierre, 4,394,200, Cl. 156-72.000.
Richard, Raymond L., Jr.: *See*—
Maki, Emil R.; Freudenstein, Ferdinand; Richard, Raymond L., Jr.; and Chew, Meng-Sang, 4,393,820, Cl. 123-90.410.
Richardson, David L.: *See*—
De Briere, John G.; Lemanowicz, Mary M.; Richardson, David L.; and Vanderputten, Willem, 4,394,345, Cl. 376-245.000.
Richardson, Edwin A.: *See*—
Lawson, Jimmie B.; and Richardson, Edwin A., 4,393,938, Cl. 166-279.000.
Richer, John E., to United States of America, Navy. Height adjustable cargo container locking mechanism. 4,394,101, Cl. 410-83.000.
Richert, Manfred: *See*—
Storandt, Ralf; Richert, Manfred; and Scheck, Georg, 4,394,032, Cl. 280-618.000.
Richman, David W.; and Walker, Charles D., to McDonnell Douglas Corporation. Electrophoresis apparatus with flow control. 4,394,246, Cl. 204-301.000.
Richon, Dominique: *See*—
Renon, Henri; and Richon, Dominique, 4,393,689, Cl. 73-64.200.
Richrath, Herbert: *See*—
Rosener, Karlheinz; Roeder, Alfred; Munchberg, Wolfgang; Richrath, Herbert; and Chmiel, Max, 4,394,454, Cl. 501-112.000.
Richter, George N.: *See*—
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,394,137, Cl. 48-197.00R.
Richter, Johan C. F. C.; and Richter, Ole J., to Kamyr, Inc. Diffuser assembly. 4,394,267, Cl. 210-331.000.
Richter, Ole J.: *See*—
Richter, Johan C. F. C.; and Richter, Ole J., 4,394,267, Cl. 210-331.000.
Ricoh Company, Ltd.: *See*—
Ameyama, Minoru, 4,394,663, Cl. 346-75.000.
Ridgway, Richard: *See*—
Verber, Carl M.; Kenan, Richard P.; and Ridgway, Richard, 4,394,060, Cl. 350-96.130.
Rieck, Gerald C., to General Motors Corporation. Electromagnetic fuel injector with flexible disc valve. 4,393,994, Cl. 239-585.000.
Ried, Harold T.; and Weaver, Edgar C., to ACF Industries, Incorporated. Cooling of center plate to avoid softening. 4,394,195, Cl. 148-149.000.
Ringbloom, Vernon D.: *See*—
Kabik, Irving; and Ringbloom, Vernon D., 4,394,197, Cl. 149-19.300.
Rink, John P. High voltage coaxial switch. 4,394,622, Cl. 377-115.000.
Ritchie, Donald, to Dornier GmbH. Arrangement and equipment for the displacement of blades, particularly propeller blades. 4,394,109, Cl. 416-142.000.
Rizzo, Salvatore A. Boat hull with underside channel. 4,393,802, Cl. 114-67.00A.
RJ Archer Inc.: *See*—
Brandt, John G.; Dickerson, Joyce H.; and Schmitt, William R., 4,394,235, Cl. 204-165.000.
Robert Bosch GmbH: *See*—
Drews, Ulrich; Werner, Peter; and Mohrle, Werner, 4,393,841, Cl. 123-440.000.
Eheim, Franz; and Hofer, Gerald, 4,393,835, Cl. 123-357.000.
Gotze, Gerd-Wolfgang; and Muller, Manfred, 4,394,627, Cl. 331-66.000.
Hansen, Jens, 4,394,779, Cl. 455-277.000.
Horstmann, Winfried, 4,394,686, Cl. 358-134.000.
Leisner, Ernst, 4,394,007, Cl. 266-249.000.
Muller, Klaus; Linder, Ernst; and Maurer, Helmut, 4,393,687, Cl. 73-35.000.
Roberts, John S.: *See*—
Mark, Harold W.; Bertus, Brent J.; and Roberts, John S., 4,394,324, Cl. 260-446.000.
Robeson, Lloyd M.: *See*—
Stratta, Julius J.; Robeson, Lloyd M.; and Girardi, Richard V., 4,394,469, Cl. 523-212.000.
Robillard, Jean J. Non-silver X-ray recording process. 4,394,439, Cl. 430-336.000.
Robinson, Earl F.: *See*—
Bare, Rex O.; and Robinson, Earl F., 4,393,584, Cl. 29-877.000.
Robinson, Joseph G.; and Barnes, David I., to Coal Industry (Patents) Limited. Polyimide resins. 4,394,499, Cl. 528-229.000.
Robinson, Merrill G., to Shatterproof Glass Corporation. Magnetron cathode sputtering apparatus. 4,394,236, Cl. 204-192.00R.
Robotgruppen HB: *See*—
Larson, Ove; and Davidson, Charles, 4,393,728, Cl. 74-469.000.
Rocci, Joseph A., Jr. Apparatus for testing the quality of the ground connection and the insulation quality in an electrical hand tool or the like. 4,394,615, Cl. 324-51.000.
Rocha, John G., to United States of America, Army. Ammunition magazine with built-in compartment covers. 4,393,746, Cl. 89-34.000.
Rockstead, Christopher A.: *See*—
Rockstead, Raymond H.; and Rockstead, Christopher A., 4,393,636, Cl. 52-381.000.
Rockstead, Raymond H.; and Rockstead, Christopher A. Box beam reinforced concrete structure. 4,393,636, Cl. 52-381.000.
Rockwell International Corporation: *See*—
Maddox, Roy L., III, 4,394,182, Cl. 148-1.500.
Wilson, Thomas E., 4,393,729, Cl. 74-475.000.
Rodell, Clifford H. Tree holder. 4,393,621, Cl. 47-40.500.
Roeder, Alfred: *See*—
Rosener, Karlheinz; Roeder, Alfred; Munchberg, Wolfgang; Richrath, Herbert; and Chmiel, Max, 4,394,454, Cl. 501-112.000.
Rogers, Charles E.: *See*—
Larsen, James E.; and Rogers, Charles E., 4,394,013, Cl. 273-1.50R.
Rogers Corporation: *See*—
Aguayo, Arturo J., 4,394,532, Cl. 174-72.00B.
Rogora, Edoardo: *See*—
De Angelis, Giancarlo; Catastini, Alberto; Bassi, Aldo; Rogora, Edoardo; Radaelli, Dario; Bertoloni, Luciano; and Perrone, Francesco, 4,393,836, Cl. 123-417.000.
Rohen, James E., to International Business Machines Corporation. Electronic velocity measurement especially for self-clocking write head. 4,394,621, Cl. 324-163.000.
Rohloff, Robert R., to Minnesota Mining and Manufacturing Company. Plating resist with improved resistance to extraneous plating. 4,394,434, Cl. 430-270.000.
Rohm GmbH: *See*—
Hartl, Roland; and Helm, Dieter, 4,394,452, Cl. 436-66.000.
Rohm and Haas Company: *See*—
Chao, Yen-Yau H., 4,394,316, Cl. 260-429.00K.

Morris, Hal C., 4,394,128, Cl. 8-138.000.
Rohr, Franz-Josef, to Brown, Boveri & Cie AG. Method for determining the oxygen content in gases, uninfluenced by temperature variations. 4,394,222, Cl. 204-1.00T.
Rohr, Otto; Pissiotas, Georg; Bohner, Beat; and Burdeska, Kurt, to Ciba-Geigy Corporation. Herbicidally active phenoxy-α-phenoxyalkanecarboxylic acid derivatives. 4,394,327, Cl. 260-455.00R.
Rohr, Wolfgang: *See*—
Eicken, Karl; Rohr, Wolfgang; and Wuerzer, Bruno, 4,394,513, Cl. 548-374.000.
Rokach, Joshua; Rooney, Clarence S.; and Cragoe, Edward J., Jr., to Merck & Co., Inc. 10,11-Dihydro-11-oxodibenzo[b,f]thiepin compounds. 4,394,515, Cl. 549-12.000.
Rolls-Royce Limited: *See*—
Pool, Francis C., 4,393,650, Cl. 60-39.093.
Rooney, Clarence S.: *See*—
Rokach, Joshua; Rooney, Clarence S.; and Cragoe, Edward J., Jr., 4,394,515, Cl. 549-12.000.
Rosenberg, Heinz: *See*—
Kreissl, Ottmar; Schurrer, Josef; Motz, Karl; Leitgeb, Wilhelm; and Rosenberg, Heinz, 4,394,582, Cl. 290-4.00C.
Rosener, Karlheinz; Roeder, Alfred; Munchberg, Wolfgang; Richrath, Herbert; and Chmiel, Max, to Dolomitwerke GmbH. Method for making sintered dolomite with a low porosity and a good hydration stability. 4,394,454, Cl. 501-112.000.
Rosensweig, Ronald E., to Exxon Research and Engineering Co. Composition for use in a magnetically fluidized bed. 4,394,281, Cl. 252-62.550.
Ross, Gerald F., to Sperry Corporation. Safe merging system using short pulse signal reflectomerty. 4,394,640, Cl. 340-23.000.
Ross, Richard J.; and Mendez, Luis E., to Baker International Corporation. Subterranean well pressure surging tool. 4,393,930, Cl. 166-188.000.
Rosselli, Andrew C.: *See*—
Breeck, Philip L.; Shultz, David E.; and Rosselli, Andrew C., 4,393,825, Cl. 123-198.00F.
Rostagno, Walter; and Morand, Alfred, to Societe d'Assistance Technique pour Produits Nestle S.A. Process for the production of a molded food product by sintering. 4,394,395, Cl. 426-285.000.
Rote, James. Step lighting system. 4,394,714, Cl. 362-32.000.
Roth, Donald J.: *See*—
Walter, John; Roth, Donald J.; and Kubis, Charles S., 4,394,408, Cl. 427-231.000.
Roth, Elwood A.: *See*—
Clark, Thomas R.; Lillmars, Alvin E.; Roth, Elwood A.; Schmick, Alvin L.; and Todd, Maurice C., 4,393,736, Cl. 83-100.000.
Roth, Michael; and Frey, Volker, to Wacker-Chemie GmbH. Process for preparing structural components. 4,394,335, Cl. 264-82.000.
Rowe, Carleton N., to Mobil Oil Corporation. Reducing fuel consumption with a fluorinated compound. 4,394,134, Cl. 44-62.000.
Rowe, William A., to Zenith Radio Corporation. Optical system for projection television. 4,394,681, Cl. 358-60.000.
RSV-Gusto Engineering B.V.: *See*—
Boon, Bart, 4,393,961, Cl. 188-67.000.
Rubber-en Kunststoffabriek ENBI B.V.: *See*—
Delhaes, Johannes C., 4,394,024, Cl. 277-207.00A.
Rubey, Robert J., to Sterling Drug Inc. Check valve for use with high pressure pump. 4,393,895, Cl. 137-539.500.
Ruell, Hartwig, to Siemens Corporation. Fingerprint sensor. 4,394,773, Cl. 382-4.000.
Ruhechemie Aktiengesellschaft: *See*—
Hobes, Victor J.; and Payer, Wolfgang, 4,394,483, Cl. 525-60.000.
Ruhrkohle Aktiengesellschaft: *See*—
Holz, Wilhelm; Lukaszewicz, Helmut; and Gregor, Karl, 4,394,217, Cl. 202-227.000.
Ruiz, Jorge M. Oyster splitter. 4,393,546, Cl. 17-76.000.
Rush, David M.: *See*—
Anthony, James R.; and Rush, David M., 4,394,019, Cl. 273-256.000.
Russell, Burdsall & Ward Corporation: *See*—
Hess, George M.; and Zils, James A., 4,393,787, Cl. 105-199.0CB.
Ryan, John F.: *See*—
Higuera, Robert S.; and Ryan, John F., 4,394,123, Cl. 432-253.000.
Ryan, Joseph L.: *See*—
Long, Nicholas R.; Peisel, William E.; Ryan, Joseph L.; and Watkins, Richard R., 4,394,650, Cl. 340-728.000.
Ryan, William H., to Owens-Illinois, Inc. Short circuit proof driver and alarm circuit for a solenoid in a glassware forming machine. 4,394,148, Cl. 65-159.000.
Rys-Sikora, John, to Du Pont de Nemours, E. I., and Company. Fast-curing foamable composition based on ethylene terpolymers. 4,394,459, Cl. 521-84.000.
Sae, Kim J. Variable ignition distributor. 4,393,849, Cl. 123-536.000.
Saeki, Tokuichi: *See*—
Sawa, Natsuo; and Saeki, Tokuichi, 4,394,511, Cl. 548-343.000.
Sage, Paul F. Method for peeling citrus fruit. 4,394,393, Cl. 426-231.000.
Sahi Electronics Co., Ltd.: *See*—
Kurosawa, Tsutomu, 4,394,697, Cl. 360-91.000.
St. Clair, Albert R., to Simmons U.S.A. Corporation. Apparatus for mattress manufacture. 4,393,792, Cl. 112-3.00R.
Saito, Shinroku: *See*—
Sawaoka, Akira; Araki, Masatada; Saito, Shinroku; and Akashi, Tamotsu, 4,394,170, Cl. 75-233.000.
Saito, Syuichiro: *See*—
Hashimoto, Teiji; and Saito, Syuichiro, 4,394,081, Cl. 354-234.000.
Saito, Takashi; Sakurayama, Junichi; and Watanabe, Tsuyoshi, to Canon Kabushiki Kaisha. Method for developing an electrostatic latent image with a liquid developer. 4,394,431, Cl. 430-119.000.
Saka, Hamid J.: *See*—
Binegar, Scott W.; and Saka, Hamid J., 4,393,889, Cl. 137-72.000.
Sakabe, Yukio; and Nishioka, Goro, to Murata Manufacturing Co., Ltd. Temperature-compensating ceramic dielectrics. 4,394,456, Cl. 501-138.000.
Sakai, Koichi, to Toko, Inc. Semiconductor integrated circuit device. 4,394,625, Cl. 330-267.000.
Sakai, Masao, to Hitachi, Ltd. Method of manufacturing hermetic sealing member. 4,393,681, Cl. 72-329.000.
Sakamura, Yoshikazu. Tool attaching device for presses. 4,393,685, Cl. 72-481.000.
Sakiyama, Kazuo: *See*—
Fujioka, Akira; Sakiyama, Kazuo; Takigawa, Akio; and Yoshida, Motoaki, 4,394,177, Cl. 106-287.140.
Sakuma, Hiraku; and Suzuki, Toshiyuki, to Nippon Electric Co., Ltd. Insulated gate field effect transistor. 4,394,674, Cl. 357-23.000.
Sakuma, Shinzo: *See*—
Warabi, Junichi; Sakuma, Shinzo; Kawaguchi, Hidemi; and Kobari, Yukio, 4,394,554, Cl. 200-144.00B.
Sakurai, Kenji; and Yoshimura, Noboru, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Interlocking mechanism of both side lock recliner for automotive seat. 4,394,048, Cl. 297-367.000.
Sakurai, Tetsuma: *See*—
Kato, Kotaro; and Sakurai, Tetsuma, 4,393,573, Cl. 29-571.000.
Sakurayama, Junichi: *See*—
Saito, Takashi; Sakurayama, Junichi; and Watanabe, Tsuyoshi, 4,394,431, Cl. 430-119.000.
Salamone, Joseph C.: *See*—
Ellis, Edward J.; and Salamone, Joseph C., 4,394,179, Cl. 134-7.000.
Sampathkumar, Prathivadibhayankaram S.; and Dwivedi, Basant K., to Chimicasa GmbH. Method of producing α-L-aspartyl-L-phenylalanine methylesters. 4,394,308, Cl. 260-112.50R.
Samuel, Olof; and Hellemaa, Heikki, to Nordstjernan AB; and Oy Warstsila AB. Braking diesel engines. 4,393,832, Cl. 123-327.000.
Sanders, Ian L.: *See*—
Hirko, Richard G.; Ju, Kochan; and Sanders, Ian L., 4,394,746, Cl. 365-36.000.
Sanders, Richard: *See*—
Muzumdar, Deepak; Mierzwa, George A.; Sanders, Richard; and Van der Meiden, Orrie J., 4,394,757, Cl. 370-100.000.
Sandhu, Jaswinder S., to Raj Technology Partnership. Portable liquid crystal testing device. 4,393,712, Cl. 73-603.000.
Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,393,532, Cl. 8-149.100.
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Method for continuous delustering high temperature treatment of a textile product and an apparatus therefor. 4,393,532, Cl. 8-149.100.
Sandoz Ltd.: *See*—
Hakl, Josef, 4,394,364, Cl. 423-483.000.
Moser, Helmut, 4,394,130, Cl. 8-661.000.
Sanford, Richard. Collapsible grill. 4,393,857, Cl. 126-9.00R.
Sano, Yasuro: *See*—
Eguchi, Yasukata; Takenoya, Hideaki; and Sano, Yasuro, 4,393,794, Cl. 112-158.00E.
Santinelli, Emil, to Lemay Corporation. Plastic lens contour cutting machine. 4,394,099, Cl. 409-104.000.
Santoro, Janet M.: *See*—
Nix, Paul T.; Santoro, Janet M.; and Stephens, Joyce E., 4,394,445, Cl. 435-19.000.
Santrade Ltd.: *See*—
Pantzar, Glenn G. E., 4,393,590, Cl. 30-387.000.
Santti, Arne J.: *See*—
Goetz, George W.; Santti, Arne J.; and LaLonde, Gary R., 4,394,033, Cl. 280-736.000.
Sanyo Electric Co., Ltd.: *See*—
Ikeguchi, Shigehiko; and Tanaka, Kouzi, 4,394,778, Cl. 455-182.000.
Tachihara, Jin; and Koyama, Hideaki, 4,394,557, Cl. 219-10.55B.
Sappelt, Reinhard, to Lonza-Werke G.m.b.H. Process for the production of the Schiff's bases of 2,6-dichloro-5-hydroxy-aniline. 4,394,521, Cl. 564-271.000.
Saretzky, Horst, to De Limon Fluhme GmbH & Co. Progressive-central lubrication system. 4,393,958, Cl. 184-7.00D.
Sari, Hikmet, to U.S. Philips Corporation. Adaptive system in a digital data receiver providing compensation for amplitude and phase distortions introduced by a data transmission channel. 4,394,768, Cl. 375-14.000.
Sasol One (Proprietary) Limited: *See*—
Jager, Berend; Brink, Andries; and Kleynjan, Cornelis, 4,394,215, Cl. 196-14.520.
Satava, George L.; and Deemer, Carroll L., to Midland Steel Products. Method for heat treating structural members. 4,394,194, Cl. 148-131.000.
Sato, Kanemasa; Ueno, Sadayasu; and Miya, Kazuhiko, to Hitachi, Ltd. Air flow rate measuring apparatus. 4,393,697, Cl. 73-118.000.
Sato, Manabu: *See*—
Yamamoto, Toshiharu; Sato, Manabu; Akiba, Katsuya; and Abe, Koreyoshi, 4,393,540, Cl. 16-114.00R.

Sato, Seiichi: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,394,382, Cl. 424-283.000.

Sato, Yoshimi, to Nissan Motor Co., Ltd. Automotive vehicle seat belt device. 4,394,035, Cl. 280-804.000.

Satoh, Kiyosumi; and Watanabe, Nobuyuki, to A. Aoki & Associates. Data processor controlled by microprograms. 4,394,735, Cl. 364-200.000.

Satoh, Nobuo: *See*—
Ito, Tadahiko; Arao, Toshio; Satoh, Nobuo; and Harada, Hiroshi, 4,394,472, Cl. 524-100.000.

Satoh, Shingo; Inoue, Takashi; Naki, Minoru; and Kawauchi, Yuji, to Nippon Steel Corporation. Method of preliminary desiliconization of molten iron by injecting gaseous oxygen. 4,394,165, Cl. 75-60.000.

Satterfield, Larry S., to Milliken Research Corporation. Apparatus to measure yarn tension. 4,393,725, Cl. 73-862.410.

Sauer, L. Peter; and Gurak, Ronald W., to Signode Corporation. Method and apparatus for pre-draping an object receiving station with flexible binding. 4,393,763, Cl. 100-2.000.

Sauerschell, Wolfgang: *See*—
Werkmann, Karl-Heinz; and Sauerschell, Wolfgang, 4,393,724, Cl. 73-861.910.

Saunders, Ian J.: *See*—
Dearnaley, Geoffrey; Steeples, Kenneth; and Saunders, Ian J., 4,394,180, Cl. 148-1.500.

Savelieva, Lidia B.: *See*—
Azarevich, Gennady M.; Gusyatsky, Iosif A.; Savelieva, Lidia B.; and Akimov, Boris I., 4,393,675, Cl. 72-71.000.

Savins, Joseph G.; and Melrose, James C., to Mobil Oil Corporation. Conditioning a coal seam prior to in-situ gasification. 4,393,934, Cl. 166-261.000.

Sawa, Natsuo; and Saeki, Tokuichi, to Shikoku Chemicals Corporation. Imidazole 4(5)-dithiocarboxylic acids or salts. 4,394,511, Cl. 548-343.000.

Sawada, Naotoshi: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,394,382, Cl. 424-283.000.

Sawaoka, Akira; Araki, Masatada; Saito, Shinroku; and Akashi, Tamotsu, to Nippon Oil and Fats Company, Limited. Composite sintered compact containing high density boron nitride and a method of producing the same. 4,394,170, Cl. 75-233.000.

Scanlon, George R., to Napco, Inc. High speed plating of flat planar workpieces. 4,394,241, Cl. 204-198.000.

Scanlon, Michael J.: *See*—
Wang, Samuel S.; and Scanlon, Michael J., 4,394,257, Cl. 209-166.000.

Scapa Dryers, Inc.: *See*—
Westhead, William T., 4,394,413, Cl. 428-257.000.

Scarpelli, Joseph A., to Eurand America, Inc. Incorporation of finely divided additives at the surface of microcapsule walls. 4,394,287, Cl. 64-4.320.

Scerbo, Louis J.: *See*—
Montalto, Anthony R.; Scerbo, Louis J.; and Starace, Jeremia P., 4,394,620, Cl. 324-149.000.

Scharr, Thomas A.: *See*—
Winchell, Vern H., II; Scharr, Thomas A.; and Clark, Lowell E., 4,394,678, Cl. 357-68.000.

Schatteman, Etienne A. M., to Staar S. A. Apparatus for automatic inverting of cassettes. 4,394,698, Cl. 360-96.500.

Scheck, Georg: *See*—
Storandt, Ralf; Richert, Manfred; and Scheck, Georg, 4,394,032, Cl. 280-618.000.

Schempp, Heinrich: *See*—
Sturm, Elmar; Schempp, Heinrich; and Martin, Henry, 4,394,152, Cl. 71-77.000.

Schenkel, Robert H., to American Cyanamid Company. Method for the control of cattle grubs employing m-phenoxybenzyl and α-cyano-m-phenoxybenzyl esters of 2-haloalkyl(oxy-, thio-, sulfinyl-, or sulfonyl)phenyl alkanoic acids. 4,394,388, Cl. 424-304.000.

Scherbing, Frank J., to Fort Lock Corporation. Switch lock. 4,394,551, Cl. 200-44.000.

Scheuble, Max; and Munsch, Paul, to Dentsply Research & Development Corp. Non-dusting and fast-wetting impression material and method of preparing same. 4,394,172, Cl. 106-38.50D.

Schilling, John R. Diverging vortex separator. 4,394,138, Cl. 55-1.000.

Schimion, Werner; and Herbrand, Josef, to SMS Schloemann-Siemag Aktiengesellschaft. Magnetic liquid filter. 4,394,264, Cl. 210-222.000.

Schinkitz, Dieter: *See*—
Hartmann, Achim; and Schinkitz, Dieter, 4,394,270, Cl. 210-726.000.

Schinozaki, Samuel S.: *See*—
Meitzler, Allen H.; Donlon, William T., Jr.; and Schinozaki, Samuel S., 4,394,672, Cl. 357-10.000.

Schlosser, Mark S., to Korry Manufacturing Co. Flip-action guard and position indicator for push-to-actuate and push-to-release switch. 4,394,552, Cl. 200-61.620.

Schlumberger Technology Corporation: *See*—
Grau, James A.; and Hertzog, Russel C., 4,394,574, Cl. 250-262.000.
Pottier, Alain; Chesnel, Pierre; and Chaintreau, Bernard, 4,393,946, Cl. 175-4.560.

Schmick, Alvin L.: *See*—
Clark, Thomas R.; Lillmars, Alvin E.; Roth, Elwood A.; Schmick, Alvin L.; and Todd, Maurice C., 4,393,736, Cl. 83-100.000.

Schmid, Wolfgang, to Dr. Ing. h.c.F. Porsche AG. Multicylinder internal combustion engine, especially for automotive vehicles and process for supplying of a fuel-air mixture thereto. 4,393,827, Cl. 123-198.00F.

Schmider, Fritz; and Muller, Rolf, to Papst-MOTOREN KG. Motor with a disk rotor. 4,394,594, Cl. 310-68.00R.

Schmidlin, Albertus E.: *See*—
Goes, Michael J.; Masly, John R.; and Schmidlin, Albertus E., 4,393,783, Cl. 102-529.000.

Schmidt, Curt, to Kernforschungszentrum Karlsruhe GmbH. Differential pressure sensor. 4,393,714, Cl. 73-718.000.

Schmidt, Yves, to Aciers et Outillage Peugeot. Safety belt buckle. 4,393,557, Cl. 24-230.00A.

Schmitt, William R.: *See*—
Brandt, John G.; Dickerson, Joyce H.; and Schmitt, William R., 4,394,235, Cl. 204-165.000.

Schmitz, Jerome J.: *See*—
Fryar, Durward; and Schmitz, Jerome J., 4,393,643, Cl. 53-471.000.

Schnabel, Rolf; Weitz, Hans-Martin; and Fischer, Rolf, to BASF Aktiengesellschaft. Regeneration of supported catalysts containing palladium and/or platinum and tellurium. 4,394,290, Cl. 252-412.000.

Schneider, Hartmut, to Siemens Aktiengesellschaft. Splittable fiber optical waveguide and method of manufacture. 4,394,062, Cl. 350-96.330.

Schneider, Werner, to Dango & Dienenthal Maschinenbau GmbH. Sealing assembly for furnace probe bore. 4,393,703, Cl. 73-432.00R.

Schnell, John W., to Toastmaster, Inc. Foot construction for portable electric space heaters. 4,394,563, Cl. 219-342.000.

Schniggenfittig, Gunther: *See*—
Cappel, Bert; Schniggenfittig, Gunther; and Schuhmann, Siegfried, 4,393,775, Cl. 101-365.000.

Schober, William R.: *See*—
Fallon, William H.; Schober, William R.; Neukirch, Edward O.; and Kirby, Donald W., 4,394,611, Cl. 320-21.000.

Scholl, Hans-Joachim, to Bayer Aktiengesellschaft. Diisocyanates useful as a structural component in the preparation of polyurethane plastics. 4,394,495, Cl. 528-67.000.

Scholz, Dieter: *See*—
Lutze, Uwe; Scholz, Dieter; and Brennsteiner, Ernst, 4,393,947, Cl. 175-323.000.

Schonhuber, Max J. Data recording system. 4,394,567, Cl. 235-375.000.

Schrader, Paul G., to Dow Chemical Company, The. Epoxidation products of 1,1,1-tri-(hydroxyphenyl) alkanes. 4,394,496, Cl. 528-98.000.

Schreiner, Joachim, to Bombardier-Rotax Gesellschaft mbH. Steering gear for a track-laying vehicle. 4,393,952, Cl. 180-6.440.

Schrodter, Klaus; and Lehr, Klaus, to Hoechst Aktiengesellschaft. Process for reducing iron in phosphoric acid solution. 4,394,360, Cl. 423-317.000.

Schroeder, Scott L., to GTE Automatic Electric Incorporated. Apparatus for aligning an optical fiber in an LED package. 4,394,061, Cl. 350-96.200.

Schroer, George A., to Cincinnati Milacron Inc. Toolholder for supporting thin rotary tools. 4,393,626, Cl. 51-168.000.

Schuhmann, Siegfried: *See*—
Cappel, Bert; Schniggenfittig, Gunther; and Schuhmann, Siegfried, 4,393,775, Cl. 101-365.000.

Schultheiss, Karl D.: *See*—
Haese, Egon; Willms, Rolf; and Schultheiss, Karl D., 4,394,363, Cl. 423-356.000.

Schultz, Michael E.: *See*—
Simning, Robert A.; and Schultz, Michael E., 4,394,094, Cl. 400-124.000.

Schulz, Hans-Hermann: *See*—
Podszun, Wolfgang; Walkowiak, Michael; and Schulz, Hans-Hermann, 4,394,465, Cl. 523-116.000.

Schupphaus, Herbert, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Nozzle holder for cutter drum in longwall mining machinery. 4,394,053, Cl. 299-81.000.

Schurrer, Josef: *See*—
Kreissl, Ottmar; Schurrer, Josef; Motz, Karl; Leitgeb, Wilhelm; and Rosenberg, Heinz, 4,394,582, Cl. 290-4.00C.

Schurter, Rolf: *See*—
Tobler, Hans; Fory, Werner; and Schurter, Rolf, 4,394,156, Cl. 71-94.000.

Schwamm, Horst: *See*—
Aste, Christian, 4,394,173, Cl. 104-69.000.

Schwind, Richard J.: *See*—
Wollar, Burnell J.; and Schwind, Richard J., 4,393,551, Cl. 24-213.00R.

Schwirzke, Fred R. Laser induced plasma production for isotope separation. 4,394,579, Cl. 250-423.00P.

Schwitters, Stephen W.: *See*—
Keyes, Richard M.; and Schwitters, Stephen W., 4,393,659, Cl. 62-66.000.

Scott, Marvin D. Flow measuring device. 4,393,722, Cl. 73-861.610.

Scott Paper Company: *See*—
Pociluyko, Alex, 4,394,212, Cl. 162-162.000.

Screeton, James B. Coating composition. 4,394,477, Cl. 524-319.000.

Security Imprinter Corporation: *See*—
Barbour, William P., 4,393,768, Cl. 101-45.000.

Sehring, Richard: *See—*
Buck, Wolfgang; Sehring, Richard; Linden, Gerbert; and Lust, Sigmund, 4,394,159, Cl. 71-98.000.

Seiden, Lewis J. Three stage minimum configuration conditionally non-blocking matrix. 4,394,541, Cl. 179-18.0GE.

Seiler, James F. N., Jr., to United States of America, Commerce. Pneumatic adhesion tester. 4,393,699, Cl. 73-150.00A.

Seitz, William R., to Bendix Corporation, The. Means for improving the efficiency of an internal combustion engine. 4,393,845, Cl. 123-478.000.

Seiver, Robert L., to Exxon Research and Engineering Co. Composition for use in a magnetically fluidized bed. 4,394,282, Cl. 252-62.550.

Sekiguchi, Hiroshi: *See—*
Tsukui, Minoru; Sekiguchi, Hiroshi; and Machida, Takatoshi, 4,393,956, Cl. 181-265.000.

Sell, Rudolf; and Kistner, Herbert, to Upat GmbH & Co. Anchor rod, method of setting it in place and method of its manufacture. 4,393,638, Cl. 52-704.000.

Sensormatic Electronics Corporation: *See—*
Humble, David R.; Weaver, Jon N.; Gentzler, David L.; Eskandry, Ezra D.; and Lamanna, Peter J., 4,394,645, Cl. 340-572.000.

Senuma, Michio; and Watanabe, Kunio, to Canon Kabushiki Kaisha. Shutter for camera. 4,394,082, Cl. 354-246.000.

Seo, Yasufumi: *See—*
Shimamura, Tadao; Nakano, Junji; and Seo, Yasufumi, 4,394,336, Cl. 264-109.000.

Seong, Baik L.: *See—*
Han, Moon H.; and Seong, Baik L., 4,394,312, Cl. 260-239.30P.

Serlin, Irving, to Monsanto Company. Vinyl acetate interpolymer latices. 4,394,479, Cl. 524-459.000.

Severson, Eugene K., to Hewlett-Packard Company. DC Switching circuit. 4,394,682, Cl. 358-73.000.

Shaffer, John W.: *See—*
Brower, Boyd G.; and Shaffer, John W., 4,394,709, Cl. 361-401.000.
Brower, Boyd G.; Broadt, David R.; and Shaffer, John W., 4,394,710, Cl. 361-401.000.

Shah, Nayan S. Midstream urine collection device. 4,393,881, Cl. 128-760.000.

Shalon, Tadmor, to Measuregraph Company, The. Computer adapted apparatus and method for pricing lengths of material. 4,394,740, Cl. 364-464.000.

Shanks, Donald E., to United States of America, Interior. High temperature hydrolysis of aluminum sulfate solutions. 4,394,368, Cl. 423-556.000.

Sharp, Bernard C., to Parker Hannifin Corporation. Reversible flag type rear view mirror. 4,394,066, Cl. 350-307.000.

Sharp Corporation: *See—*
Mahon, Douglas K., 4,394,695, Cl. 360-53.000.

Sharp Kabushiki Kaisha: *See—*
Takeda, Mikio; Kakihara, Yoshinobu; Yoshida, Masaru; and Nakata, Yukihiko, 4,394,601, Cl. 313-509.000.

Shatterproof Glass Corporation: *See—*
Robinson, Merrill G., 4,394,236, Cl. 204-192.00R.

Shaw, David B.: *See—*
Nappholz, Tibor A.; Hinch, Barry; and Shaw, David B., 4,393,874, Cl. 128-419.0PT.

Shaw, Donald E.: *See—*
Shaw, Jack B.; and Shaw, Donald E., 4,394,045, Cl. 297-118.000.

Shaw, Jack B.; and Shaw, Donald E. Sportsman sling seat and game haul. 4,394,045, Cl. 297-118.000.

Shell Oil Company: *See—*
Dilgren, Richard E.; and Owens, Kenneth B., 4,393,937, Cl. 166-272.000.
Foster, Elton G., 4,394,367, Cl. 423-502.000.
Lawson, Jimmie B.; and Richardson, Edwin A., 4,393,938, Cl. 166-279.000.
Waller, Jan; and Loof, Philippus, 4,394,119, Cl. 431-5.000.

Shen, John C. S.: *See—*
Ottman, John C.; and Shen, John C. S., 4,393,628, Cl. 51-281.0SF.

Shen, Roderick C., to Mobil Oil Corporation. Catalytic dewaxing process. 4,394,249, Cl. 208-89.000.

Shepard, Joseph F.: *See—*
Gardiner, James R; Makarewicz, Stanley R.; Revitz, Martin; and Shepard, Joseph F., 4,394,406, Cl. 427-86.000.

Shephard, Margaret C.: *See—*
Balasubramanyan, Sugavanam; and Shephard, Margaret C., 4,394,380, Cl. 424-269.000.

Sherman, John D.: *See—*
Chao, Chien C.; and Sherman, John D., 4,394,178, Cl. 127-46.300.

Sherrill, George F., to George F. and Irene Sherrill 1978 Trust No. 1; and George F. and Irene Sherrill 1978 Trust No. 2. Method for the relief of pain. 4,394,381, Cl. 424-274.000.

Shibata, Koichiro, to Cuisinarts, Inc. Julienne cutter for food processors. 4,393,737, Cl. 83-356.300.

Shifflett, David C.: *See—*
Hough, Louis E.; De Vigili, Walter J.; and Shifflett, David C., 4,394,044, Cl. 296-218.000.

Shigyo, Hiromichi: *See—*
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,394,382, Cl. 424-283.000.

Shikoku Chemicals Corporation: *See—*
Sawa, Natsuo; and Saeki, Tokuichi, 4,394,511, Cl. 548-343.000.

Shikoku Electric Power Co., Inc.: *See—*
Shima, Michitsune; Kihara, Shiso; Omichi, Takeo; Igarashi, Taenji; and Mangetsu, Kenji, 4,393,920, Cl. 165-11.00A.

Shikoku Kasei Kogyo Company Ltd.: *See—*
Shimamura, Tadao; Nakano, Junji; and Seo, Yasufumi, 4,394,336, Cl. 264-109.000.

Shima, Kenji; and Hibino, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Sound reproduction device. 4,394,536, Cl. 179-1.00G.

Shima, Kenji; and Hibino, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Sound reproduction device. 4,394,537, Cl. 179-1.00G.

Shima, Michitsune; Kihara, Shiso; Omichi, Takeo; Igarashi, Taenji; and Mangetsu, Kenji, to Kansai Electric Power Co., Inc., The; Kyushu Electric Power Co., Inc.; Shikoku Electric Power Co., Inc.; and Mitsubishi Jukogyo Kabushiki Kaisha. Manipulator for working in a heat exchanger. 4,393,920, Cl. 165-11.00A.

Shimada, Nobuyoshi: *See—*
Umezawa, Hamao; Shimada, Nobuyoshi; Naganawa, Hiroshi; Takita, Tomohisa; Hamada, Masa; and Takeuchi, Tomio, 4,394,446, Cl. 435-88.000.

Shimamura, Tadao; Nakano, Junji; and Seo, Yasufumi, to Shikoku Kasei Kogyo Company Ltd. Production of tablets of sodium dichloroisocyanurate. 4,394,336, Cl. 264-109.000.

Shimamura, Yasuki: *See—*
Miyake, Tetsuya; Takeda, Kunihiko; Onitsuka, Hatsuki; Okuyama, Kazuo; and Shimamura, Yasuki, 4,394,353, Cl. 423-21.500.

Shimbo, Masafumi, to Kabushiki Kaisha Daini Seikosha. Method for fabricating integrated circuits. 4,393,574, Cl. 29-571.000.

Shimizu, Isamu; Shirai, Shigeru; and Inoue, Eiichi, to Canon Kabushiki Kaisha. Photoconductive member with α-Si(C) barrier layer. 4,394,425, Cl. 430-65.000.

Shimizu, Isamu; Shirai, Shigeru; and Inoue, Eiichi, to Canon Kabushiki Kaisha. Photoconductive member with α-Si(N) barrier layer. 4,394,426, Cl. 430-65.000.

Shimizu, Noboru: *See—*
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,394,382, Cl. 424-283.000.

Shimizu, Yoshikazu; and Yamaguchi, Kathuhiro, to Azona Co., Ltd. Film-paper fiber layer laminate and process for preparation thereof. 4,394,416, Cl. 428-341.000.

Shimp, Lawrence A.; and Steinhauer, John E., to FMC Corporation. Shrimp processing. 4,394,396, Cl. 426-332.000.

Shingu, Masataka: *See—*
Uchiyama, Nobuhiro; Shingu, Masataka; and Tsukada, Saburo, 4,394,211, Cl. 156-628.000.

Shinkle, George A.: *See—*
Johnston, Daniel U.; and Shinkle, George A., 4,393,688, Cl. 73-35.000.

Shionogi & Co., Ltd.: *See—*
Kamata, Susumu; and Nagata, Wataru, 4,394,505, Cl. 544-91.000.

Shioya, Yoshimi; Maeda, Mamoru; Takasaki, Kanetake; and Takagi, Mikio, to Fujitsu Limited. Method of plasma enhanced chemical vapor deposition of phosphosilicate glass film. 4,394,401, Cl. 427-39.000.

Shirai, Shigeru: *See—*
Shimizu, Isamu; Shirai, Shigeru; and Inoue, Eiichi, 4,394,425, Cl. 430-65.000.
Shimizu, Isamu; Shirai, Shigeru; and Inoue, Eiichi, 4,394,426, Cl. 430-65.000.

Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, to Kowa Company, Ltd. Dihydrobenzopyran compounds and pharmaceutical composition comprising said compounds. 4,394,382, Cl. 424-283.000.

Shirley, Robert E., to International Business Machines Corporation. System and method for generating enlarged or reduced images. 4,394,693, Cl. 358-298.000.

Shirley, William C.: *See—*
Kaiser, Kenneth L.; and Shirley, William C., 4,394,026, Cl. 277-231.000.

Shoji, Osamu: *See—*
Okabe, Yousuke; and Shoji, Osamu, 4,394,331, Cl. 261-18.00B.

Shonk, Phyllis: *See—*
O'Boyle, Dolores; and Shonk, Phyllis, 4,393,875, Cl. 128-425.000.

Short, Robert D., III, to Sperry Corporation. Adaptive MTI clutter tracker-canceller method and apparatus. 4,394,658, Cl. 343-7.700.

Shultz, David E.: *See—*
Breeck, Philip L.; Shultz, David E.; and Rosselli, Andrew C., 4,393,825, Cl. 123-198.00F.

Shum, Martin N. Y., to General DataComm Industries, Inc. Data transmission over long distance circuits. 4,394,767, Cl. 375-13.000.

Sian, Sucha S., to Essex Group, Inc. Miniature plug-in fuse assembly and method of making a fuse element therefor. 4,394,638, Cl. 337-264.000.

Siebert, Steve L., to D & S Manufacturing. Tractor mounted forklift. 4,394,107, Cl. 414-631.000.

Siemens: *See—*
Kreissl, Ottmar; Schurrer, Josef; Motz, Karl; Leitgeb, Wilhelm; and Rosenberg, Heinz, 4,394,582, Cl. 290-4.00C.

Siemens Aktiengesellschaft: *See—*
Dull, Hans J.; and Hillmer, Adolf, 4,393,786, Cl. 104-141.000.
Ertl, Wilhelm; Lachmann, Ulrich; and Pertsch, Heinrich, 4,394,190, Cl. 148-31.550.
Gfrerer, Manfred, 4,394,193, Cl. 148-129.000.

Kammerlander, Karl, 4,394,760, Cl. 370-111.000.
Pape, Heinz; Quella, Ferdinand; and Krueger, Hans, 4,394,068, Cl. 350-345.000.
Penzel, Hans-Joerg, 4,394,753, Cl. 365-236.000.
Schneider, Hartmut, 4,394,062, Cl. 350-96.330.
Siemens Corporation: *See*—
Muzumdar, Deepak; Mierzwa, George A.; Sanders, Richard; and Van der Meiden, Orrie J., 4,394,757, Cl. 370-100.000.
Ruell, Hartwig, 4,394,773, Cl. 382-4.000.
Sievert, Raymond. Multi-fueled boiler. 4,393,814, Cl. 122-22.000.
Signode Corporation: *See*—
Sauer, L. Peter; and Gurak, Ronald W., 4,393,763, Cl. 100-2.000.
Silberstein, Donald A., to Brown & Williamson Tobacco Corporation. Cigarette filter. 4,393,885, Cl. 131-339.000.
Simmons U.S.A. Corporation: *See*—
St. Clair, Albert R., 4,393,792, Cl. 112-3.00R.
Simning, Robert A.; and Schultz, Michael E., to Pako Corporation. Slide motion sensor for slide mount data printer. 4,394,094, Cl. 400-124.000.
Simpson, Howard D.: *See*—
Miller, J. Wayne; and Simpson, Howard D., 4,394,302, Cl. 252-465.000.
Singer Company, The: *See*—
Dunn, William H.; Horey, Leonard I.; and Kurland, Marvin, 4,393,796, Cl. 112-158.00E.
Marsh, Walter H. W., 4,393,797, Cl. 112-158.00B.
Singer, Mortimer. Apparatus for positioning a treating liquid at the bottom of a well. 4,393,927, Cl. 166-105.000.
Sipos, Laszlo: *See*—
Golimowski, Jerzy; Sipos, Laszlo; and Valenta, Paul, 4,394,238, Cl. 204-400.000.
Sirey, Michael. Surfboard carrying rack. 4,393,986, Cl. 224-32.00A.
Skappel, Einar. Method and device for automatic irrigation. 4,393,890, Cl. 137-78.200.
Skatsche, Othmar: *See*—
Obermayer, Bertram; Skatsche, Othmar; and Greier, Josef, 4,393,822, Cl. 123-195.00R.
Skil Corporation: *See*—
Emerle, Emil; and Gawron, Alex F., 4,394,612, Cl. 320-31.000.
Skinner, Robert T. J., to Lucas Industries Limited. Liquid fuel pumping apparatus. 4,393,844, Cl. 123-450.000.
Slabaugh, Edward J., to Comptech, Incorporated. Radial vane gas throttling valve for vacuum systems. 4,393,896, Cl. 137-601.000.
Slavov, Rashko R.: *See*—
Vutov, Stancho H.; and Slavov, Rashko R., 4,393,916, Cl. 164-119.000.
Sloane, Michael W., Sr.: *See*—
Cooper, Larry V.; and Sloane, Michael W., Sr., 4,393,940, Cl. 166-325.000.
Slusarski, Ronald S.: *See*—
Chmura, William J.; and Slusarski, Ronald S., 4,394,421, Cl. 428-547.000.
Small, Vernon R., Jr., to Chevron Research Company. Method for improving fuel economy of internal combustion engines using sulfur-containing alkanediols. 4,394,276, Cl. 252-32.70E.
Small, Vernon R., Jr., to Chevron Research Company. Method for improving fuel economy of internal combustion engines using borated sulfur-containing 1,2-alkane diols. 4,394,277, Cl. 252-32.70E.
Smirnov, Viktor S.: *See*—
Gryaznov, Vladimir M.; Smirnov, Viktor S.; Vdovin, Valentin M.; Ermilova, Margarita M.; Gogua, Liya D.; Pritula, Nina A.; and Fedorova, Galina K., 4,394,294, Cl. 252-430.000.
Smith, Charles W.; and Borchardt, John K., to Halliburton Services. Clay stabilization during oil and gas well cementing operations. 4,393,939, Cl. 166-293.000.
Smith, Dale A.: *See*—
Barton, Roy C.; and Smith, Dale A., 4,394,031, Cl. 280-515.000.
Smith, Daniel M.: *See*—
Borras, Jaime A.; Gonzalez, Ruben J.; Smith, Daniel M.; and Wieczorek, Alfred B., 4,394,776, Cl. 455-76.000.
Smith, David H. Ice skate carrier. 4,394,042, Cl. 294-163.000.
Smith, David T. Cold forced sintered powder metal annular bearing ring blanks. 4,393,563, Cl. 29-149.5DP.
Smith, George H., to Minnesota Mining and Manufacturing Company. Photopolymerizable compositions. 4,394,403, Cl. 427-42.000.
Smith, Harry A., to Dow Chemical Company, The. Alkyl acetates as phase separation inhibitors in liquid hydrocarbon fuel and ethanol mixtures. 4,394,133, Cl. 44-56.000.
Smith International, Inc.: *See*—
Liljestrand, Walter E., 4,394,140, Cl. 55-184.000.
Oelke, Erwin S., 4,394,020, Cl. 277-1.000.
Smith, James; and Lamport, Daphne L., to U.S. Philips Corporation. Flat cathode ray tube. 4,394,599, Cl. 313-422.000.
Smith, Judson L. Vehicle drying machine and method. 4,393,602, Cl. 34-34.000.
Smith, Michael B.: *See*—
Nolte, Kenneth G.; and Smith, Michael B., 4,393,933, Cl. 166-250.000.
Smith, Paul K.: *See*—
Benny, John R.; Buher, Robert W.; and Smith, Paul K., 4,394,259, Cl. 209-250.000.
Smith, Richard D. Cabinet for video game consoles, cartridges, accessories, and instruction booklets. 4,394,055, Cl. 312-196.000.
Smither, Miles A.: *See*—
Browne, Edward M.; and Smither, Miles A., 4,394,616, Cl. 324-52.000.
SmithKline Beckman Corporation: *See*—
Kruse, Lawrence I., 4,394,514, Cl. 548-508.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Folta, Werner; and Kost, Erwin, 4,393,683, Cl. 72-422.000.
Schimion, Werner; and Herbrand, Josef, 4,394,264, Cl. 210-222.000.
SMS Schloemann-Siemag, Inc.: *See*—
Kovacs, Daniel C., 4,393,680, Cl. 72-234.000.
Smyth, Nicholas P. D.; Lesniak, Jeanne M.; and Stokes, Kenneth B., to Medtronic, Inc. Single pass A-V lead. 4,393,883, Cl. 128-785.000.
Snoek, Govert J.; and Tuil, William J., to Ocean B.V. Device for temporarily rinsing a water cock countersunk in the ground. 4,393,891, Cl. 137-238.000.
Snyder General Corporation: *See*—
Wiese, John M.; and Hoeffken, Russell W., 4,394,111, Cl. 417-360.000.
S.A. Des Etablissements Staubli: *See*—
Burquier, Jean-Luc, 4,394,039, Cl. 285-85.000.
Societe Anonyme dite: L'Oreal: *See*—
Kalopissis, Gregoire, 4,394,520, Cl. 562-557.000.
Societe Brochier et Fils: *See*—
Bompard, Bruno; and Bruyere, Alain, 4,394,203, Cl. 156-175.000.
Societe d'Application Plastique Mecanique et Electronique Plastimecanique S.A.: *See*—
Dronet, Jean-Marc, 4,394,115, Cl. 425-122.000.
Societe D'Applications Generales: *See*—
Picard, Jean-Francois; and Jacquard, Paul, 4,393,597, Cl. 33-275.00G.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Rostagno, Walter; and Morand, Alfred, 4,394,395, Cl. 426-285.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": *See*—
Delabie, Jacques J. A., 4,394,531, Cl. 174-24.000.
Societe Nationale Elf Aquitaine: *See*—
Pereyre, Michel; and Pommier, Jean-Claude, 4,394,320, Cl. 260-429.700.
Societe Nationale Elf Aquitaine (Production): *See*—
Lazarre, Flavien, 4,393,990, Cl. 239-1.000.
Societe Nationale Industrielle Aerospatiale: *See*—
Cahuzac, Georges J. J., 4,393,669, Cl. 66-13.000.
Societe Vandeputte Fils & Cie, S.A.: *See*—
Rabette, Jean, 4,394,652, Cl. 340-764.000.
Soltis, Frank G.: *See*—
Hoffman, Roy L.; Houdek, Merle E.; Loen, Larry W.; and Soltis, Frank G., 4,394,727, Cl. 364-200.000.
Solvay & Cie: *See*—
Nicolas, Edgard, 4,394,231, Cl. 204-129.000.
Sonoi, Hidekazu: *See*—
Asami, Takayoshi; and Sonoi, Hidekazu, 4,393,924, Cl. 165-104.120.
Sony Corporation: *See*—
Amano, Toshio; Nagai, Kunio; and Honma, Juri, 4,394,691, Cl. 358-194.100.
Kobayashi, Katsumi, 4,394,690, Cl. 358-180.000.
Menezes, William A.; and Kuper, Douglas D., 4,394,745, Cl. 364-900.000.
Ninomiya, Ichiro; and Takayama, Jun, 4,394,694, Cl. 360-14.300.
Sood, Ashwani: *See*—
Weissman, Sherman M.; Pereira, Dennis; and Sood, Ashwani, 4,394,443, Cl. 435-6.000.
Sou, Teho. Watering device for pet animals. 4,393,813, Cl. 119-72.500.
Soucy, John J.: *See*—
Soucy, Paul B.; and Soucy, John J., 4,393,954, Cl. 180-205.000.
Soucy, Paul B.; and Soucy, John J. Motorized bicycle. 4,393,954, Cl. 180-205.000.
Sowash, Thomas R.: *See*—
Long, Donald A.; and Sowash, Thomas R., 4,394,555, Cl. 200-159.00R.
Spahni, Kurt; and Bucher, Walter, to Bauer Kassenfabrik AG. Switching device for checking the closed position of a folding door. 4,394,584, Cl. 307-117.000.
Spencer, Billie M.: *See*—
Currie, Robert J.; Rattlingourd, Glen D.; Spencer, Billie M.; and Zscheile, John W., Jr., 4,394,642, Cl. 340-347.0DD.
Speranza, George P.: *See*—
Cuscurida, Michael; Grice, Neal J.; and Speranza, George P., 4,394,463, Cl. 521-167.000.
Sperlich, Harold K., to Chrysler Corporation. Pickup truck cargo box cover assembly. 4,394,100, Cl. 410-2.000.
Sperry Corporation: *See*—
Boothe, Guy, 4,394,702, Cl. 361-92.000.
Butler, L. Dennis; and Askov, Alan R., 4,394,103, Cl. 414-24.500.
Currie, Robert J.; Rattlingourd, Glen D.; Spencer, Billie M.; and Zscheile, John W., Jr., 4,394,642, Cl. 340-347.0DD.
Freitag, Walter O.; and Suchodolski, Victor V., 4,394,160, Cl. 75-0.5AA.
Martenas, Wayne B., 4,393,644, Cl. 56-12.800.
Pataki, Andrew B., 4,394,592, Cl. 310-12.000.
Ross, Gerald F., 4,394,640, Cl. 340-23.000.
Short, Robert D., III, 4,394,658, Cl. 343-7.700.
Swenson, Robert E., 4,394,732, Cl. 364-200.000.
Swenson, Robert E., 4,394,733, Cl. 364-200.000.
Zbinden, Terry B., 4,393,921, Cl. 165-40.000.
Spires, Howard R., to Syntex (U.S.A.) Inc. Ruminant animal performance by co-administering choline and propionate enchancers. 4,394,377, Cl. 424-177.000.

Spooner, Colin R., to Delorean Research Limited Partnership. Apparatus for securing an article to a plastic frame-like structure. 4,394,050, Cl. 297-468.000.
Sportelli, Frank A. Printing screen and method of making same. 4,394,424, Cl. 430-6.000.
Spratt, Lorenzo. Stable ice release agent. 4,394,283, Cl. 252-70.000.
Sprecher & Schuh AG: *See*—
Wallimann, Hubert, 4,394,550, Cl. 200-34.000.
Spreng, Georg. Sports shoe. 4,393,605, Cl. 36-114.000.
Springer, Hartmut, to Hoechst Aktiengesellschaft. Process for the finishing of fibrous materials: sulfonyl- or carbonyl-cyanamides of dyestuffs. 4,394,129, Cl. 8-543.000.
Spruijt, Aloysius M. J. M.; Wijburg, Matheus A. T.; Benschop, Gerardus C. M.; and Vos, Hendrikus J. M., to U.S. Philips Corporation. Display device. 4,394,067, Cl. 350-334.000.
Srednеaziatsky Filial Vniipromgaz: *See*—
Golovanov, Alexandr V.; Eschenko, Vladislav Y.; Musaev, Irsali K.; and Talibdzhanov, Zakhidzhan S., 4,394,120, Cl. 431-284.000.
Staar S. A.: *See*—
Schatteman, Etienne A. M., 4,394,698, Cl. 360-96.500.
Stacey, Eric J.: *See*—
Brennen, Michael B.; Gyugyi, Laszlo; and Stacey, Eric J., 4,394,614, Cl. 323-210.000.
Stage, Hermann; Hammer, Hartmut; and Kuhns, Walter, to Wilhelm Schmidding GmbH & Co., Firma. Method of deodorizing and/or deacidifying high-boiling organic compounds, particularly edible oils. 4,394,221, Cl. 203-89.000.
Stamm, Dieter: *See*—
Krull, Manfred; Lobert, Udo; Stamm, Dieter; and Veeser, Klaus, 4,394,411, Cl. 428-70.000.
Standard Duplicating Machines Corporation: *See*—
Bergman, Carl A.; Thomas, Roy L.; and Bourbeau, Richard A., 4,394,009, Cl. 271-10.000.
Standard Microsystems Corporation: *See*—
Burstein, Steve; and Popper, Jay, 4,394,751, Cl. 365-227.000.
Standard Oil Company (Indiana): *See*—
Cartmell, Robert R., 4,394,349, Cl. 422-147.000.
Nolte, Kenneth G.; and Smith, Michael B., 4,393,933, Cl. 166-250.000.
Puskas, Imre; and James, David E., 4,394,299, Cl. 252-447.000.
Standing, Colin A. Electric fence energizers. 4,394,583, Cl. 307-108.000.
Stanley Automatic Openers: *See*—
Lemirande, Rodger P., 4,394,607, Cl. 318-453.000.
Starace, Jeremia P.: *See*—
Montalto, Anthony R.; Scerbo, Louis J.; and Starace, Jeremia P., 4,394,620, Cl. 324-149.000.
Stark, Lucille. Pillow. 4,393,530, Cl. 5-437.000.
Stauffer Chemical Company: *See*—
Hardy, Thomas A.; and Liu, Sophia Y., 4,394,330, Cl. 260-932.000.
Steeples, Kenneth: *See*—
Dearnaley, Geoffrey; Steeples, Kenneth; and Saunders, Ian J., 4,394,180, Cl. 148-1.500.
Steger, Barry N.: *See*—
Lowery, Richard E.; Gordon, Bruce W.; and Steger, Barry N., 4,394,323, Cl. 260-446.000.
Steinhauer, John E.: *See*—
Shimp, Lawrence A.; and Steinhauer, John E., 4,394,396, Cl. 426-332.000.
Stephens, Joyce E.: *See*—
Nix, Paul T.; Santoro, Janet M.; and Stephens, Joyce E., 4,394,445, Cl. 435-19.000.
Sterling Drug Inc.: *See*—
Rubey, Robert J., 4,393,895, Cl. 137-539.500.
Sterrenberg, John W., to Sterrenberg, John W. Leveling mechanisms for hand-held power drill. 4,393,599, Cl. 33-336.000.
Stevens, Barry A. Chimney fire snuffer. 4,393,941, Cl. 169-70.000.
Stevens, Bruce W., to Menasha Corporation. Attachment system for plastic liners. 4,394,096, Cl. 403-408.000.
Stevenson, Martin J.: *See*—
Doyle, Francis S.; Prince, Terry B.; and Stevenson, Martin J., 4,394,545, Cl. 179-179.000.
Stewart, James B. Collapsible traffic barricade. 4,394,005, Cl. 256-64.000.
Stiftelsen Industriellt Utvecklingscentrum: *See*—
Andersson, Albert, 4,393,943, Cl. 172-260.500.
Stillman, Suzanne: *See*—
Nawash, Michael S.; Stillman, Suzanne; and Mason, Robert S., 4,393,873, Cl. 604-151.000.
Stocker, Hans M.: *See*—
Hujsak, Edward J.; and Stocker, Hans M., 4,393,541, Cl. 16-297.000.
Stockton, James G.: *See*—
Powell, Steven W.; and Stockton, James G., 4,393,598, Cl. 33-302.000.
Stokes, Jimmy L., to Milliken Research Corporation. Apparatus for imparting visual surface effects to relatively moving materials. 4,393,562, Cl. 26-2.00R.
Stokes, Kenneth B.: *See*—
Smyth, Nicholas P. D.; Lesniak, Jeanne M.; and Stokes, Kenneth B., 4,393,883, Cl. 128-785.000.
Stolzer, Claus, to Bayer Aktiengesellschaft. Process for the preparation of N,N-dimethyl-N-(2-bromo-4-methylphenyl)-triazene. 4,394,309, Cl. 260-140.000.
Storandt, Ralf; Richert, Manfred; and Scheck, Georg, to Geze GmbH. Ski safety binding. 4,394,032, Cl. 280-618.000.
Storey, Robert C.: *See*—
Jadwin, Thomas A.; and Storey, Robert C., 4,394,430, Cl. 430-110.000.
Stott, Paul E., to Uniroyal, Inc. Azocarboxylate blowing agent. 4,394,461, Cl. 521-113.000.
Stover, K. Lawrence: *See*—
Bueno, Alejandro G.; and Stover, K. Lawrence, 4,394,122, Cl. 432-30.000.
Strack, Martin P., Jr., to Polyvend Inc. Honor system vending machine. 4,393,970, Cl. 194-17.000.
Strang, Robert: *See*—
Jenkner, Herbert; Strang, Robert; and Adermann, Peter, 4,394,484, Cl. 525-72.000.
Strasilla, Dieter; Moldovanyi, Laszlo; Fearnley, Charles; and Meindl, Hubert, to Ciba-Geigy Corporation. Mixtures of quaternary, polymeric, high molecular weight ammonium salts, which are based on acrylic compounds, and surfactants, their preparation, and their use in cosmetics. 4,393,886, Cl. 132-7.000.
Stratta, Julius J.; Robeson, Lloyd M.; and Girardi, Richard V., to Union Carbide Corporation. Polysiloxane treated antimony compounds. 4,394,469, Cl. 523-212.000.
Strauss, Werner: *See*—
Heintges, Siegfried; Strauss, Werner; and Weiffen, Karl-Heinz, 4,394,260, Cl. 209-500.000.
Street, John N.: *See*—
McIntosh, Walter L.; and Street, John N., 4,394,089, Cl. 355-88.000.
Streifeneder, Ludwig: *See*—
Reznik, Benjamin; Welber, Stanley; and Streifeneder, Ludwig, 4,393,872, Cl. 604-151.000.
Strunk, Norman E.; and Poboreski, Anton P. Sprinkler head assembly. 4,393,992, Cl. 239-200.000.
Sturm, Elmar; Schempp, Heinrich; and Martin, Henry, to Ciba-Geigy Corporation. Sulfur-containing oxime compounds for protecting cultivated plants. 4,394,152, Cl. 71-77.000.
Sturm, Werner. Apparatus for producing an arc welded sleeve. 4,393,571, Cl. 29-564.600.
Suchodolski, Victor V.: *See*—
Freitag, Walter O.; and Suchodolski, Victor V., 4,394,160, Cl. 75-0.5AA.
Suchoff, Michael A.; Doyle, Holly T.; and Doyle, Robert O., to I/O Corporation. Communication terminal providing user communication of high comprehension. 4,394,649, Cl. 340-711.000.
Suderman, Donald A., to Kansas State University Research Foundation. Undercutter seed planter. 4,393,791, Cl. 111-34.000.
Sugihara, Kunihiko; and Onoda, Michio, to Nissan Motor Company, Limited. Spark timing control system for an internal combustion engine. 4,393,837, Cl. 123-425.000.
Sugitani, Hiroshi; Matsuda, Hiroto; Kimura, Koichi; and Ikeda, Masami, to Canon Kabushiki Kaisha. Ink jet head and method for fabrication thereof. 4,394,670, Cl. 346-140.00R.
Sugitani, Yuji: *See*—
Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, 4,394,559, Cl. 219-125.120.
Sugiyama, Mitsuhiko, to Rank Xerox Limited. Automatic and manual sheet feeding mechanism. 4,394,008, Cl. 271-9.000.
Sulzer Brothers Limited: *See*—
Meier, Hans, 4,393,752, Cl. 92-86.000.
Sumitomo Chemical Company, Limited: *See*—
Fujioka, Akira; Sakiyama, Kazuo; Takigawa, Akio; and Yoshida, Motoaki, 4,394,177, Cl. 106-287.140.
Kirino, Osamu; Hirano, Masachika; Takeda, Hisami; and Kato, Toshiro, 4,394,379, Cl. 424-211.000.
Yamada, Yasuharu; and Kawai, Kiyoshi, 4,394,292, Cl. 252-429.00B.
Sumitomo Metal Industries, Ltd.: *See*—
Kusaba, Yoshiaki, 4,393,679, Cl. 72-221.000.
Ohtani, Hiroo; and Watanabe, Seiichi, 4,394,187, Cl. 148-12.00F.
Sun Electric Corporation: *See*—
Marten, John A.; Legler, Donald; and Wagoner, Jesse W., 4,393,694, Cl. 73-117.000.
Sundmar, Goran: *See*—
Gustavsson, Olle; and Sundmar, Goran, 4,393,747, Cl. 89-45.000.
Sundseth, Jarl. Air cleaners. 4,394,145, Cl. 55-347.000.
Sundstrand Data Control, Inc.: *See*—
Atherton, Kim W., 4,394,405, Cl. 427-58.000.
Sutton, Trevor G.: *See*—
Clark, Walter L.; and Sutton, Trevor G., 4,393,692, Cl. 73-115.000.
Suzuki, Kouichi; and Mori, Kazuyuki, to Nissan Motor Company, Limited. Automatic speed control system for an automotive vehicle. 4,394,739, Cl. 364-426.000.
Suzuki, Seigo; and Eguchi, Seiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Multi-processor system employing job-swapping between different priority processors. 4,394,730, Cl. 364-200.000.
Suzuki, Tadashi; and Kishi, Norimasa, to Nissan Motor Co., Ltd. Abnormality treatment device for automatic transmission control device. 4,393,732, Cl. 74-866.000.
Suzuki, Toshiyuki: *See*—
Sakuma, Hiraku; and Suzuki, Toshiyuki, 4,394,674, Cl. 357-23.000.
Suzuki, Yasuo: *See*—
Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, 4,394,559, Cl. 219-125.120.
Suzuki, Yoshihisa; Kaizuka, Takanoli; Hanyu, Yoshiaki; Otake, Mituyoshi; and Hidano, Yoichi, to Hitachi, Ltd. Method for producing magnetic recording medium. 4,394,404, Cl. 427-48.000.

Svarc, Stanislav: *See—*
Rambousek, Miroslav; and Svarc, Stanislav, 4,393,648, Cl. 57-413.000.

Svendsen, Noel A.: *See—*
Lapeyre, James M.; Svendsen, Noel A.; Carroll, Raymond J., Jr.; Long, Henry H.; and Lindberg, Richard S., 4,393,544, Cl. 17-73.000.

Swanson, Arthur P. Windshield visor mirror. 4,394,065, Cl. 350-304.000.

Swenson, Robert E., to Sperry Corporation. Cache/disk subsystem trickle. 4,394,732, Cl. 364-200.000.

Swenson, Robert E., to Sperry Corporation. Cache/disk subsystem. 4,394,733, Cl. 364-200.000.

Swift, Harold E.: *See—*
Madgavkar, Ajay M.; and Swift, Harold E., 4,394,296, Cl. 252-433.000.
Vogel, Roger F.; Marcelin, George; and Swift, Harold E., 4,394,525, Cl. 568-462.000.

SWS Silicones Corporation: *See—*
Martin, Eugene R.; and Tripp, Jeffrey A., 4,394,517, Cl. 556-419.000.
McAfee, Richard C.; Adkins, James; and Miskowski, Richard L., 4,394,317, Cl. 260-429.00R.

Sybron Corporation: *See—*
Mehra, Ravinder C.; and Aggarwal, Raj K., 4,394,266, Cl. 210-244.000.

Sykora, George S.: *See—*
Thomas, William R.; and Sykora, George S., 4,394,202, Cl. 156-94.000.

Syn-Trac Systems Inc.: *See—*
Forshee, David J., 4,393,999, Cl. 248-346.000.

Syntex (U.S.A.) Inc.: *See—*
Spires, Howard R., 4,394,377, Cl. 424-177.000.

Szoka, Francis C., Jr.; and Papahadjopoulos, Demetrios P. Plant nutriment compositions and method of their application. 4,394,149, Cl. 71-28.000.

Szoka, Francis C., Jr.; and Papahadjopoulos, Demetrios P. Method of inserting DNA into living cells. 4,394,448, Cl. 435-172.000.

Tabler, Donald C.: *See—*
Nowack, Gerhard P.; Johnson, Marvin M.; and Tabler, Donald C., 4,394,298, Cl. 252-438.000.

Tachihara, Jin; and Koyama, Hideaki, to Sanyo Electric Co., Ltd. Electronic controlled heat cooking apparatus. 4,394,557, Cl. 219-10.55B.

Tacquet, Maurice. Mixing unit. 4,393,854, Cl. 123-576.000.

Tadashi, Mitsui: *See—*
Hiraku, Imaizumi; and Tadashi, Mitsui, 4,394.636, Cl. 336-172.000.

Taguchi, Tatsuhisa: *See—*
Maruyama, Teruo; Onoda, Tadayuki; and Taguchi, Tatsuhisa, 4,394,114, Cl. 418-269.000.

Takagi, Mikio: *See—*
Shioya, Yoshimi; Maeda, Mamoru; Takasaki, Kanetake; and Takagi, Mikio, 4,394,401, Cl. 427-39.000.

Takagi, Toshinori: *See—*
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,394,210, Cl. 156-608.000.

Takahashi, Hiroshi, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Printer with printing drum. 4,393,770, Cl. 101-93.220.

Takahashi, Kenji; Yamazaki, Hisashi; Miyahara, Junji; Kotera, Noboru; Eguchi, Shusaku; and Miura, Norio, to Fuji Photo Film Co., Ltd. Radiation image storage panel. 4,394,581, Cl. 250-484.100.

Takahashi, Masao: *See—*
Nagano, Genzo; and Takahashi, Masao, 4,394,763, Cl. 371-38.000.
Takeuchi, Fumio; and Takahashi, Masao, 4,394,198, Cl. 149-21.000.

Takahashi, Toru; and Ueno, Sadayasu, to Hitachi, Ltd. Ball-circulation type liquid flow rate sensor. 4,393,720, Cl. 73-861.050.

Takahashi, Yukio: *See—*
Isogai, Hideaki; and Takahashi, Yukio, 4,394,657, Cl. 340-825.930.

Takami, Katsumi: *See—*
Tanaka, Eiichi; Nohara, Norimasa; Murayama, Hideo; Ishimatsu, Kenji; Ogushi, Akira; and Takami, Katsumi, 4,394,576, Cl. 250-366.000.

Takara Co., Ltd.: *See—*
Murakami, Kazuya, 4,393,620, Cl. 46-201.000.

Takasaki, Kanetake: *See—*
Shioya, Yoshimi; Maeda, Mamoru; Takasaki, Kanetake; and Takagi, Mikio, 4,394,401, Cl. 427-39.000.

Takasaki, Yukio: *See—*
Tsukada, Toshihisa; Takasaki, Yukio; Hirai, Tadaaki; Baji, Toru; Yamamoto, Hideaki; Tanaka, Yasuo; Maruyama, Eiichi; and Ishioka, Sachio, 4,394,749, Cl. 365-106.000.

Takasugi, Hisashi: *See—*
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,394,384, Cl. 424-246.000.

Takatama, Isao. Method for recovering waste heat as motive power. 4,393,657, Cl. 60-653.000.

Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, to Fujisawa Pharmaceutical Co., Ltd. Aminothiazole cycloalkenyloxyimino acetamido cephem derivatives. 4,394,384, Cl. 424-246.000.

Takayama, Jun: *See—*
Ninomiya, Ichiro; and Takayama, Jun, 4,394,694, Cl. 360-14.300.

Takeda, Hisami: *See—*
Kirino, Osamu; Hirano, Masachika; Takeda, Hisami; and Kato, Toshiro, 4,394,379, Cl. 424-211.000.

Takeda, Kunihiko: *See—*
Miyake, Tetsuya; Takeda, Kunihiko; Onitsuka, Hatsuki; Okuyama, Kazuo; and Shimamura, Yasuki, 4,394,353, Cl. 423-21.500.

Takeda, Mikio; Kakihara, Yoshinobu; Yoshida, Masaru; and Nakata, Yukihiko, to Sharp Kabushiki Kaisha. ZnS:Mn Thin-film electroluminescent element with memory function. 4,394,601, Cl. 313-509.000.

Takematsu, Yoshiyuki, to Fuji Koeki Kabushiki Kaisha, a part interest. Photographic flash device operatively responsive to the luminance of an object to be photographed to prevent overexposure. 4,394,079, Cl. 354-33.000.

Takenaka, Sadao: *See—*
Kurihara, Hiroshi; Takenaka, Sadao; and Itaya, Eiji, 4,394,626, Cl. 331-12.000.

Takenoya, Hideaki: *See—*
Eguchi, Yasukata; Takenoya, Hideaki; and Sano, Yasuro, 4,393,794, Cl. 112-158.00E.
Makabe, Hachiro; Watanabe, Kazuo; Takenoya, Hideaki; Kume, Toshiaki; and Kakinuma, Toshihide, 4,393,795, Cl. 112-158.00E.

Takeuchi, Fumio; and Takahashi, Masao, to Nippon Oil and Fats Company, Limited. Water-in-oil emulsion explosive composition. 4,394,198, Cl. 149-21.000.

Takeuchi, Tomio: *See—*
Umezawa, Hamao; Shimada, Nobuyoshi; Naganawa, Hiroshi; Takita, Tomohisa; Hamada, Masa; and Takeuchi, Tomio, 4,394,446, Cl. 435-88.000.

Takigawa, Akio: *See—*
Fujioka, Akira; Sakiyama, Kazuo; Takigawa, Akio; and Yoshida, Motoaki, 4,394,177, Cl. 106-287.140.

Takimoto, Masaaki: *See—*
Kawaguchi, Hideo; Inayama, Takayuki; Takimoto, Masaaki; and Ono, Yoshihiro, 4,394,441, Cl. 430-524.000.

Takita, Tomohisa: *See—*
Umezawa, Hamao; Shimada, Nobuyoshi; Naganawa, Hiroshi; Takita, Tomohisa; Hamada, Masa; and Takeuchi, Tomio, 4,394,446, Cl. 435-88.000.

Talibdzhanov, Zakhidzhan S.: *See—*
Golovanov, Alexandr V.; Eschenko, Vladislav Y.; Musaev, Irsali K.; and Talibdzhanov, Zakhidzhan S., 4,394,120, Cl. 431-284.000.

Tallent, Othar K.; Dodson, Karen E.; and Mailen, James C., to United States of America, Energy. Method for cleaning solution used in nuclear fuel reprocessing. 4,394,269, Cl. 210-690.000.

Tamai, Kiminori; and Hayama, Masashi, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,394,420, Cl. 428-447.000.

Tamm, Rolf; and Tomoff, Toma, to Bodenseeverk Perkin-Elmer & Co. GmbH. Sampling valve useful in liquid chromatography. 4,393,726, Cl. 73-864.840.

Tamura, Manabu; Kamemura, Yoshiki; and Handa, Masao, to Nippon Kokan Kabushiki Kaisha. Plugs for use in piercing and elongating mills. 4,393,677, Cl. 72-97.000.

Tamura, Masao: *See—*
Wada, Yasuo; Usui, Hiroo; Ohkura, Makoto; Miyao, Masanobu; Tamura, Masao; and Tokuyama, Takashi, 4,394,191, Cl. 148-33.100.

Tanaka, Akira: *See—*
Nishida, Minoru; Hattori, Tadashi; and Tanaka, Akira, 4,393,850, Cl. 123-536.000.

Tanaka, Eiichi; Nohara, Norimasa; Murayama, Hideo; Ishimatsu, Kenji; Ogushi, Akira; and Takami, Katsumi, to National Institute of Radiological Sciences; and Hitachi Medical Corporation. Apparatus for detecting the location of incident radiation. 4,394,576, Cl. 250-366.000.

Tanaka, Hideki; and Otsuka, Kazutoshi, to Tokyo Kogyo Co., Ltd. Fuel control system for automobile engine. 4,393,840, Cl. 123-440.000.

Tanaka, Kouzi: *See—*
Ikeguchi, Shigehiko; and Tanaka, Kouzi, 4,394,778, Cl. 455-182.000.

Tanaka, Takayuki; and Matsumoto, Rempei, to Fuji Jukogyo Kabushiki Kaisha. System for controlling cooling water temperature for water-cooled engine. 4,393,819, Cl. 123-41.080.

Tanaka, Yasuo: *See—*
Tsukada, Toshihisa; Takasaki, Yukio; Hirai, Tadaaki; Baji, Toru; Yamamoto, Hideaki; Tanaka, Yasuo; Maruyama, Eiichi; and Ishioka, Sachio, 4,394,749, Cl. 365-106.000.

Tao, Eddie V. P., to Eli Lilly and Company. Process for preparing an isoxazolylurea. 4,394,510, Cl. 548-240.000.

Tapp, Ruel W. Dual mode vacuum cleaner. 4,393,536, Cl. 15-327.00C.

Tarle, Gregory. Track recording plastic compositions. 4,394,307, Cl. 524-776.000.

Tarumi, Noriyoshi; Tsuchiya, Hiroshi; Kokiso, Masakazu; and Ohta, Hiroaki, to Konishiroku Photo Industry Co., Ltd.; and Hokushin Industries Corporation. Method of producing thin-walled endless belt. 4,394,340, Cl. 264-219.000.

Tatis Plasttatnigar AB: *See—*
Dahlberg, Anders, 4,394,715, Cl. 362-153.000.

Tatsumi, Juichi, to Ye Data Inc. Printing head for a printer. 4,393,771, Cl. 101-93.480.

Taybos Sociedad Anonima: *See—*
Bosnia, Omar J., 4,394,015, Cl. 273-73.00C.

Taylor, Arnold E., to Discovision Associates. Hot sprue sleeve valve assembly for an injection molding machine. 4,394,117, Cl. 425-549.000.

Taylor, David W., to Ergon, Inc. Particulate coal-in-liquid mixture and process for the production thereof. 4,394,132, Cl. 44-51.000.

Taylor Freezer Company: *See—*
Keyes, Richard M.; and Schwitters, Stephen W., 4,393,659, Cl. 62-66.000.

Taylor, Glenn N., to Kendall Company, The. Device for collecting body liquids. 4,393,880, Cl. 128-760.000.

Taylor, James L., to Procter & Gamble Company, The. Process for making lipid membrane structures. 4,394,372, Cl. 424-85.000.

TDK Electronics Co., Ltd.: *See*—
Hiraku, Imaizumi; and Tadashi, Mitsui, 4,394,636, Cl. 336-172.000.
Tamai, Kiminori; and Hayama, Masashi, 4,394,420, Cl. 428-447.000.

Teague, H. Derek, to Ace Orthopedic Manufacturing Inc. Colles fracture fixature device. 4,393,868, Cl. 128-92.00A.

Team Form AG: *See*—
Munz, Johann, 4,393,623, Cl. 49-248.000.

Tekno-Detaljer Sture Carlsson AB: *See*—
Favot, Guido; and Berg, Alf A., 4,393,678, Cl. 72-131.000.

Telectronics Pty. Ltd.: *See*—
Nappholz, Tibor A.; Hinch, Barry; and Shaw, David B., 4,393,874, Cl. 128-419.0PT.

Teledyne Industries, Inc.: *See*—
Ramey, Robert M., 4,393,527, Cl. 4-493.000.

TEMCO, Inc.: *See*—
Benny, John R.; Buher, Robert W.; and Smith, Paul K., 4,394,259, Cl. 209-250.000.

Temple, Chester S., to PPG Industries, Inc. Aqueous sizing composition and glass fibers made therewith for reinforcing thermosetting polymers. 4,394,418, Cl. 428-391.000.

Temple, Chester S.; and Hsu, Ed C., to PPG Industries, Inc. Aqueous sizing composition for producing sized glass fiber strands with improved slip flow properties. 4,394,475, Cl. 524-262.000.

Tennant Company: *See*—
Olson, Donald L., 4,393,538, Cl. 15-320.000.

Teradyne, Inc.: *See*—
Janke, Elden W., 4,394,056, Cl. 312-216.000.

Terakado, Katsuyoshi: *See*—
Asahi, Naotatsu; Yamaguchi, Sizuka; and Terakado, Katsuyoshi, 4,394,234, Cl. 204-164.000.

Terashita, Takaaki, to Fuji Photo Film Co., Ltd. Method of controlling exposure. 4,394,078, Cl. 354-31.000.

Terazawa, Hidehito, to Nippondenso Co., Ltd. Load drive control system. 4,394,605, Cl. 318-280.000.

Terrien, Michel E.; and Bouvet, Claude, to Etat Francais. Device for lap-joint engagement of two bridge elements on intrados or extrados and bridge element comprising it. 4,393,533, Cl. 14-2.600.

Terwilliger, Gerald L.: *See*—
Merritt, Robert C.; and Terwilliger, Gerald L., 4,393,852, Cl. 123-564.000.

Tescher, Andrew G.: *See*—
Widergren, Robert D.; Chen, Wen-Hsiung; Fralick, Stanley C.; and Tescher, Andrew G., 4,394,774, Cl. 382-56.000.

Texaco Inc.: *See*—
Cuscurida, Michael; Grice, Neal J.; and Speranza, George P., 4,394,463, Cl. 521-167.000.
Lewis, Paul H.; and Nelson, Gerald V., 4,394,254, Cl. 208-310.00Z.
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,394,137, Cl. 48-197.00R.
Moser, Henry D., 4,394,261, Cl. 210-96.100.

Texas Alkyls, Inc.: *See*—
Malpass, Dennis B.; and Yeargin, G. Scott, 4,394,326, Cl. 260-448.0AD.

Texas Instruments Incorporated: *See*—
Doherty, John, Jr., 4,393,834, Cl. 123-339.000.

Textron Inc.: *See*—
Chmura, William J.; and Slusarski, Ronald S., 4,394,421, Cl. 428-547.000.
Olmr, Jaroslav J., 4,393,739, Cl. 83-834.000.

Theilacker, Klaus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Rotary sheet printing machine with transport chain. 4,393,773, Cl. 101-232.000.

Theodore, Ares N.: *See*—
Chattha, Mohinder S.; and Theodore, Ares N., 4,394,486, Cl. 525-162.000.

Thermal Systems Limited: *See*—
Fischer, Victor H., 4,393,653, Cl. 60-511.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Apparatus for replacing rail fastening elements and, optionally, rails. 4,393,784, Cl. 104-2.000.

Thies, Peter, to Wagener Schwelm GmbH & Co. Belt press with hose-type actuator. 4,393,766, Cl. 100-99.000.

Thimons, Edward D.; Heller, Kenneth S.; McCoy, John F., III; and Whillier, Austin, to United States of America, Interior. Water spray cooler. 4,394,142, Cl. 55-242.000.

Thiokol Corporation: *See*—
Barnes, Michael W., 4,394,329, Cl. 260-467.000.
Wade, Robert C.; and Guilbault, Lawrence J., 4,394,226, Cl. 204-72.000.
Wade, Robert C., 4,394,458, Cl. 521-82.000.

Thomas & Betts Corporation: *See*—
Herb, Philip J., 4,393,548, Cl. 24-16.0PB.

Thomas, Charles E.: *See*—
Batchelder, Clarence F.; Thomas, Charles E.; and Casady, Kent B., 4,394,102, Cl. 414-5.000.

Thomas J. Lipton, Inc.: *See*—
Tresser, David, 4,394,392, Cl. 426-101.000.

Thomas Jefferson University: *See*—
Galkin, Benjamin M.; Boon, Raymond; Gilliam, Rudolph V.; and Park, Chan H., 4,393,864, Cl. 128-1.100.
Osterholm, Jewell L., 4,393,863, Cl. 128-1.00R.

Thomas, Roy L.: *See*—
Bergman, Carl A.; Thomas, Roy L.; and Bourbeau, Richard A., 4,394,009, Cl. 271-10.000.

Thomas, William R.; and Sykora, George S., to UMAC, Inc.; and Brooklyn Union Gas Company, a part interest. Method for relining an underground gas line or the like without excavation. 4,394,202, Cl. 156-94.000.

Thompson, Richard D.; Tsaur, Boryeu; and Tu, King-Ning, to International Business Machines Corporation. Rare earth silicide Schottky barriers. 4,394,673, Cl. 357-15.000.

Thomson-CSF: *See*—
Pham, Ngu T.; and Nuzillat, Gerard, 4,394,589, Cl. 307-450.000.
Ratigalas, Max, 4,394,641, Cl. 340-347.0DD.

Thorell, Jan I. Radioimmunoassay reagents. 4,394,391, Cl. 424-366.000.

Thorn, Brent: *See*—
Thorn, M. W.; Thorn, E. R.; and Thorn, Brent, 4,393,734, Cl. 81-468.000.

Thorn, E. R.: *See*—
Thorn, M. W.; Thorn, E. R.; and Thorn, Brent, 4,393,734, Cl. 81-468.000.

Thorn, M. W.; Thorn, E. R.; and Thorn, Brent, to Van F. Belknap Co., Inc. Combined torque limiting and marking wrench. 4,393,754, Cl. 81-468.000.

Threshold Technology, Inc.: *See*—
Warren, Ben; White, George M.; Parfitt, Rick; and Deng, Peter, 4,394,538, Cl. 179-1.0SD.

TII Corporation: *See*—
Jones, Raymond D., 4,394,704, Cl. 361-119.000.

Timex Corporation: *See*—
Willis, Alan E.; Lowdenslager, John R.; and Goldstein, Neal, 4,394,540, Cl. 179-2.0AM.

Toastmaster, Inc.: *See*—
Schnell, John W., 4,394,563, Cl. 219-342.000.

Tobler, Hans; Fory, Werner; and Schurter, Rolf, to Ciba-Geigy Corporation. Novel N-phenyl-substituted N-heterocyclic compounds, their preparation and use in agents for regulating plant growth. 4,394,156, Cl. 71-94.000.

Todd, Maurice C.: *See*—
Clark, Thomas R.; Lillmars, Alvin E.; Roth, Elwood A.; Schmick, Alvin L.; and Todd, Maurice C., 4,393,736, Cl. 83-100.000.

Todd, Mike J.: *See*—
Lee, Jeffrey A.; and Todd, Mike J., 4,393,534, Cl. 15-98.000.

Toko, Inc.: *See*—
Sakai, Koichi, 4,394,625, Cl. 330-267.000.

Tokuyama, Takashi: *See*—
Wada, Yasuo; Usui, Hiroo; Ohkura, Makoto; Miyao, Masanobu; Tamura, Masao; and Tokuyama, Takashi, 4,394,191, Cl. 148-33.100.

Tokyo Kogyo Co., Ltd.: *See*—
Tanaka, Hideki; and Otsuka, Kazutoshi, 4,393,840, Cl. 123-440.000.

Tokyo Sanyo Electric Co. Ltd.: *See*—
Ikeguchi, Shigehiko; and Tanaka, Kouzi, 4,394,778, Cl. 455-182.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Gocho, Yoshitsugu, 4,394,593, Cl. 310-54.000.
Ishikawa, Ken, 4,394,764, Cl. 372-38.000.
Iwai, Hiroshi, 4,394,196, Cl. 148-187.000.
Kimura, Tadatomo; and Noguchi, Takeshi, 4,394,596, Cl. 310-184.000.
Komatsu, Shigeru; and Nakamura, Michio, 4,394,436, Cl. 430-311.000.
Morooka, Shinichi, 4,394,346, Cl. 376-258.000.
Nabeshima, Daiki, 4,394,762, Cl. 371-38.000.
Suzuki, Seigo; and Eguchi, Seiji, 4,394,730, Cl. 364-200.000.
Tsuji, Tadashi; and Igarashi, Ryokichi, 4,393,899, Cl. 138-89.000.
Yoshimaru, Tomohisa, 4,394,696, Cl. 360-78.000.

Tokyo Sokuhan Co., Ltd.: *See*—
Izumi, Masao; Yoshida, Hiroshi; and Yoshikawa, Yukio, 4,393,897, Cl. 137-831.000.

Tomic, Ernst A., to Du Pont de Nemours, E. I., and Company. Phosphate cement and mortar. 4,394,174, Cl. 106-85.000.

Tomic, Mladomir: *See*—
Winter, John P.; and Tomic, Mladomir, 4,394,473, Cl. 524-226.000.

Tomimori, Akinobu: *See*—
Hara, Michio; Tomimori, Akinobu; and Hara, Hiroshi, 4,394,542, Cl. 179-81.00B.

Tomoff, Toma: *See*—
Tamm, Rolf; and Tomoff, Toma, 4,393,726, Cl. 73-864.840.

Tomoyori, Makoto: *See*—
Harumatsu, Masatoshi; Tomoyori, Makoto; and Tsushima, Noboru, 4,393,709, Cl. 73-505.000.

Torgersen, Robert H.: *See*—
Jeffras, Nathaniel B.; and Torgersen, Robert H., 4,393,991, Cl. 239-102.000.

Toyoda, Hideaki, to Komori Printing Machinery Co., Ltd. Ink fountain device for use in printing press. 4,393,776, Cl. 101-365.000.

Toyoda Jidosha Kogyo Kabushiki Kaisha: *See*—
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, 4,393,966, Cl. 192-56.00R.

Toyota Jidosha Kabushiki Kaisha: *See*—
Naito, Tadashi, 4,393,693, Cl. 73-116.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Sakurai, Kenji; and Yoshimura, Noboru, 4,394,048, Cl. 297-367.000.

Transamerica DeLaval Inc.: *See*—
Allen, Walter E.; and Wilson, Douglas D., 4,393,998, Cl. 248-74.00R.

Tresser, David, to Thomas J. Lipton, Inc. Processes for producing composite ice confections, and products thereof. 4,394,392, Cl. 426-101.000.

Trethewy, Derek C.: *See*—
Cole, Denis B.; and Trethewy, Derek C., 4,393,640, Cl. 53-69.000.

Triangle Package Machinery Company: *See*—
Klopfenstein, King L.; and Connors, Robert H., 4,393,950, Cl. 177-108.000.

Tricamo, Stephen J.: *See*—
Lowen, Gerard G.; and Tricamo, Stephen J., 4,393,690, Cl. 73-66.000.

Trinh, Eugene H.: *See*—
Barmatz, Martin B.; Trinh, Eugene H.; Wang, Taylor G.; Elleman, Daniel D.; and Jacobi, Nathan, 4,393,708, Cl. 73-505.000.

Tripp, Jeffrey A.: *See*—
Martin, Eugene R.; and Tripp, Jeffrey A., 4,394,517, Cl. 556-419.000.

Trutzschler GmbH & Co. KG: *See*—
Hosel, Fritz, 4,393,547, Cl. 19-105.000.

TRW Inc.: *See*—
Hyde, Robert L., 4,394,090, Cl. 368-121.000.
Martin, Jon W., 4,394,478, Cl. 524-424.000.

Tryber, Robert E.; and Hoffman, George A., to Gettys Manufacturing Co., Inc. Machine tool tracing system. 4,394,608, Cl. 318-578.000.

Trybulski, Eugene J., to Hoffmann-La Roche Inc. Production of 2-benzazepines. 4,394,311, Cl. 260-239.0BB.

Tsaur, Boryeu: *See*—
Thompson, Richard D.; Tsaur, Boryeu; and Tu, King-Ning, 4,394,673, Cl. 357-15.000.

Tsuchiya, Hiroshi: *See*—
Tarumi, Noriyoshi; Tsuchiya, Hiroshi; Kokiso, Masakazu; and Ohta, Hiroaki, 4,394,340, Cl. 264-219.000.

Tsuda, Shunji. Electromagnetic wave energy absorbing material. 4,394,415, Cl. 428-332.000.

Tsuda, Yukifumi: *See*—
Yoshida, Kunio; Kotera, Hiroaki; Tsuda, Yukifumi; Kanno, Yoshimitsu; and Naka, Motohiko, 4,394,662, Cl. 346-33.00R.

Tsudakoma Kogyo Kabushiki Kaisha: *See*—
Ida, Yoshio, 4,393,903, Cl. 139-370.200.

Tsuji, Tadashi; and Igarashi, Ryokichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Plugging apparatus. 4,393,899, Cl. 138-89.000.

Tsukada, Saburo: *See*—
Uchiyama, Nobuhiro; Shingu, Masataka; and Tsukada, Saburo, 4,394,211, Cl. 156-628.000.

Tsukada, Toshihisa; Takasaki, Yukio; Hirai, Tadaaki; Baji, Toru; Yamamoto, Hideaki; Tanaka, Yasuo; Maruyama, Eiichi; and Ishioka, Sachio, to Hitachi, Ltd. Photoelectric device and method of producing the same. 4,394,749, Cl. 365-106.000.

Tsukui, Minoru; Sekiguchi, Hiroshi; and Machida, Takatoshi, to Fuji Jukogyo Kabushiki Kaisha. Draining device used in a car-muffler. 4,393,956, Cl. 181-265.000.

Tsunekawa, Sukeyoshi: *See*—
Homma, Yoshio; Tsunekawa, Sukeyoshi; Morisaki, Hiroshi; and Harada, Seiki, 4,394,245, Cl. 204-298.000.

Tsushima, Noboru: *See*—
Harumatsu, Masatoshi; Tomoyori, Makoto; and Tsushima, Noboru, 4,393,709, Cl. 73-505.000.

Tu, King-Ning: *See*—
Thompson, Richard D.; Tsaur, Boryeu; and Tu, King-Ning, 4,394,673, Cl. 357-15.000.

Tuftco Corporation: *See*—
Beasley, Max M., 4,393,793, Cl. 112-79.00R.

Tuil, William J.: *See*—
Snoek, Govert J.; and Tuil, William J., 4,393,891, Cl. 137-238.000.

Tukamoto, Masahiro, to Nippon Seiko Kabushiki Kaisha. Emergency locking type retractor. 4,393,995, Cl. 242-107.40A.

Tulloss, Joseph C.: *See*—
Arnold, William S., Jr.; and Tulloss, Joseph C., 4,393,582, Cl. 29-828.000.

Tuman, Cazimir. Aircraft arrestment system. 4,393,996, Cl. 244-110.00C.

Tumber, Brian W., to Lucas Industries Limited. Liquid fuel injection pumping apparatus. 4,393,826, Cl. 123-198.0DB.

Tung, William C. T., to Goodyear Tire & Rubber Company, The. Water dispersible polyester compositions. 4,394,490, Cl. 525-438.000.

Tuong, Duc L.: *See*—
Bienvenu, Jacques; Dufond, Patrick; Carre, Claude; Tuong, Duc L.; Verdier, Henri; deRivet, Philippe-Hubert; Bradley, John J.; and Franklin, Benjamin S., 4,394,725, Cl. 364-200.000.

Turner, John T.; Gulati, Harish C.; Hall, William B.; and Watson, Arnold, to Victoria University of Manchester, The. Apparatus for measuring fluid flow. 4,393,721, Cl. 73-861.210.

Turnquist, Cecil E.: *See*—
Egly, Richard S.; and Turnquist, Cecil E., 4,394,220, Cl. 203-42.000.

Tylko, Jozef K., to Plasma Holdings N.V. Treatment of matter in low temperature plasmas. 4,394,162, Cl. 75-10.00R.

Uchida, Yasumi: *See*—
Shiratsuchi, Masami; Shimizu, Noboru; Shigyo, Hiromichi; Kyotani, Yoshinori; Kunieda, Hisashi; Kawamura, Kiyoshi; Sato, Seiichi; Akashi, Toshihiro; Nagakura, Masahiko; Sawada, Naotoshi; and Uchida, Yasumi, 4,394,382, Cl. 424-283.000.

Uchiyama, Nobuhiro; Shingu, Masataka; and Tsukada, Saburo, to Fujitsu Limited. Method of manufacturing a semiconductor device having a layer of polymide resin. 4,394,211, Cl. 156-628.000.

Ueda, Yasukiyo: *See*—
Mori, Keiichi; Ueda, Yasukiyo; and Mori, Keijiro, 4,393,858, Cl. 126-351.000.

Ueki, Masato: *See*—
Wada, Masahiko; and Ueki, Masato, 4,393,981, Cl. 221-289.000.

Ueno, Sadayasu: *See*—
Sato, Kanemasa; Ueno, Sadayasu; and Miya, Kazuhiko, 4,393,697, Cl. 73-118.000.
Takahashi, Toru; and Ueno, Sadayasu, 4,393,720, Cl. 73-861.050.

Uffner, William E., to Owens-Corning Fiberglas Corporation. Modified asphalt composition. 4,394,482, Cl. 525-54.500.

Uhlmann, Klaus-Peter: *See*—
Uhlmann, Otto; and Uhlmann, Klaus-Peter, 4,393,566, Cl. 29-417.000.

Uhlmann, Otto; and Uhlmann, Klaus-Peter, to Kabel-und Metallwerke Gutehoffnungshutte AG. Processing of copper tubing. 4,393,566, Cl. 29-417.000.

Ujikawa, Norihisa; and Fukushi, Kyosuke, to Nippon Oil and Fats Co., Ltd. Low shrinkage unsaturated polyester resin composition. 4,394,480, Cl. 525-43.000.

Ullman, Myron E., Jr.: *See*—
Kessler, Milton; and Ullman, Myron E., Jr., 4,393,978, Cl. 215-253.000.

UMAC, Inc.: *See*—
Thomas, William R.; and Sykora, George S., 4,394,202, Cl. 156-94.000.

Umetsu, Noriharu: *See*—
Kawata, Mitsuyasu; Umetsu, Noriharu; and Fukuto, Tetsuo R., 4,394,383, Cl. 424-285.000.

Umezawa, Hamao; Shimada, Nobuyoshi; Naganawa, Hiroshi; Takita, Tomohisa; Hamada, Masa; and Takeuchi, Tomio, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Process for the preparation of the antibiotic oxanosine. 4,394,446, Cl. 435-88.000.

Union Carbide Corporation: *See*—
Bartkovitz, David J.; and Greene, George H., 4,394,493, Cl. 525-530.000.
Chao, Chien C.; and Sherman, John D., 4,394,178, Cl. 127-46.300.
Hannum, Roy R., 4,394,161, Cl. 75-0.5BC.
Keogh, Michael J., 4,394,471, Cl. 524-92.000.
Stratta, Julius J.; Robeson, Lloyd M.; and Girardi, Richard V., 4,394,469, Cl. 523-212.000.
Weinberg, Kurt; and Johnson, Gordon C., 4,394,295, Cl. 252-431.00C.

Union Oil Company of California: *See*—
Josendal, Virgil A., 4,393,936, Cl. 166-263.000.
Miller, J. Wayne; and Simpson, Howard D., 4,394,302, Cl. 252-465.000.

Uniroyal, Inc.: *See*—
Farber, Milton; and Worns, John R., 4,394,435, Cl. 430-287.000.
Plant, Howard L.; Cantor, Steven E.; Doweyko, Arthur M.; Dekeyser, Mark A.; and Bell, Allyn R., 4,394,155, Cl. 71-94.000.
Stott, Paul E., 4,394,461, Cl. 521-113.000.

Uniroyal Ltd.: *See*—
Plant, Howard L.; Cantor, Steven E.; Doweyko, Arthur M.; Dekeyser, Mark A.; and Bell, Allyn R., 4,394,155, Cl. 71-94.000.

United International California Corporation: *See*—
Grabis, Dietrich W., 4,394,136, Cl. 48-111.000.

United Kingdom Atomic Energy Authority: *See*—
Dearnaley, Geoffrey; Steeples, Kenneth; and Saunders, Ian J., 4,394,180, Cl. 148-1.500.

United Kingdom of Great Britain and Northern Ireland, The Minister of Transport in Her Britannic Majesty's Government of the: *See*—
Armour, John S.; Watson, Peter M. F.; and Donne, Graham L., 4,393,980, Cl. 220-85.00S.

United States of America
Agriculture: *See*—
Cadmus, Martin C.; and Knutson, Clarence A., Jr., 4,394,447, Cl. 435-104.000.
Wilke, Douglas A., 4,393,862, Cl. 126-448.000.
Air Force: *See*—
Gibler, David L.; and O'Connell, Daniel J., 4,393,997, Cl. 244-135.00R.
Hall, R. Dean, 4,394,223, Cl. 204-15.000.
Army: *See*—
Goes, Michael J.; Masly, John R.; and Schmidlin, Albertus E., 4,393,783, Cl. 102-529.000.
Mayo, Henry C.; and Millman, William V., 4,393,745, Cl. 89-1.806.
Rocha, John G., 4,393,746, Cl. 89-34.000.
Zacharin, Alexey T., 4,393,780, Cl. 102-255.000.
Commerce: *See*—
Seiler, James F. N., Jr., 4,393,699, Cl. 73-150.00A.
Energy: *See*—
Tallent, Othar K.; Dodson, Karen E.; and Mailen, James C., 4,394,269, Cl. 210-690.000.
Interior: *See*—
Oudenhoven, Martin S., 4,394,051, Cl. 299-16.000.
Shanks, Donald E., 4,394,368, Cl. 423-556.000.
Thimons, Edward D.; Heller, Kenneth S.; McCoy, John F., III; and Whillier, Austin, 4,394,142, Cl. 55-242.000.
National Aeronautics and Space Administration: *See*—
Barmatz, Martin B., 4,393,706, Cl. 73-505.000.
Barmatz, Martin B.; Trinh, Eugene H.; Wang, Taylor G.; Elleman, Daniel D.; and Jacobi, Nathan, 4,393,708, Cl. 73-505.000.
Clark, Ronald K.; and Lisagor, W. Barry, 4,393,716, Cl. 73-818.000.

Dolland, Carlisle R., 4,394,610, Cl. 318-803.000.
Harris, Raymond P., 4,393,777, Cl. 101-407.0BP.
Kohl, Wayne H., 4,394,726, Cl. 364-200.000.
Wren, Paul E., 4,394,777, Cl. 455-95.000.
Navy: *See—*
Bauman, Ronald M., 4,394,624, Cl. 330-151.000.
Gould, Gilbert, 4,394,556, Cl. 200-161.000.
Kabik, Irving; and Ringbloom, Vernon D., 4,394,197, Cl. 149-19.300.
Mooradian, Gregory C., 4,394,780, Cl. 455-618.000.
Richer, John E., 4,394,101, Cl. 410-83.000.
Wallace, Edward L.; and Wright, Theodore, 4,394,689, Cl. 358-168.000.
Wrench, Edwin H., Jr., 4,394,744, Cl. 364-553.000.
U.S. Philips Corporation: *See—*
Bruinsma, John, 4,394,775, Cl. 455-17.000.
Gijzen, Wilhelmus A. H., 4,394,755, Cl. 369-45.000.
Mahieu, Marc; Vandenberg, Philippe; and Varon, Jacques J., 4,393,806, Cl. 118-412.000.
Nagelkerke, Petrus J. J., 4,393,585, Cl. 30-34.100.
Nicholas, Keith H., 4,394,181, Cl. 148-1.500.
Nieboer, Gerrit, 4,394,054, Cl. 312-7.200.
Petroons, Jose O. G., 4,394,637, Cl. 336-192.000.
Sari, Hikmet, 4,394,768, Cl. 375-14.000.
Smith, James; and Lamport, Daphne L., 4,394,599, Cl. 313-422.000.
Spruijt, Aloysius M. J. M.; Wijburg, Matheus A. T.; Benschop, Gerardus C. M.; and Vos, Hendrikus J. M., 4,394,067, Cl. 350-334.000.
Van Hooreweder, Godwin J. O. G., 4,393,579, Cl. 29-740.000.
Van Pelt, Pieter; and Lippits, Gerardus J. M., 4,394,438, Cl. 430-321.000.
Verhoeven, Leonardus A. J., 4,394,684, Cl. 358-111.000.
Wagner, Wolfgang, 4,394,738, Cl. 364-414.000.
Weiss, Hermann; Klotz, Erhard; Peemoller, Horst; Linde, Rolf; and Mauser, Wilfried, 4,394,063, Cl. 350-162.130.
United Technologies Corporation: *See—*
Ferrar, Carl M., 4,393,707, Cl. 73-505.000.
Wiegand, Walter J.; and Bullis, Robert H., 4,393,719, Cl. 73-861.050.
University of California, Regents of the: *See—*
Kawata, Mitsuyasu; Umetsu, Noriharu; and Fukuto, Tetsuo R., 4,394,383, Cl. 424-285.000.
University of Kentucky Research Foundation: *See—*
Hussain, Anwar A.; Hirai, Shinichiro; and Bawarshi, Rima, 4,394,390, Cl. 424-330.000.
UOP Inc.: *See—*
Brunelle, Rene J., 4,394,047, Cl. 297-361.000.
Gatsis, John G., 4,394,248, Cl. 208-10.000.
Upat GmbH & Co.: *See—*
Sell, Rudolf; and Kistner, Herbert, 4,393,638, Cl. 52-704.000.
Urano, Shigeru, to Nippon Piston Ring Co., Ltd. Cylinder or cylinder liner. 4,393,821, Cl. 123-195.00C.
Ushijima, Richard N. Thymus gland extracts. 4,394,374, Cl. 424-95.000.
Usui, Hiroo: *See—*
Wada, Yasuo; Usui, Hiroo; Ohkura, Makoto; Miyao, Masanobu; Tamura, Masao; and Tokuyama, Takashi, 4,394,191, Cl. 148-33.100.
Vakil, Himanshu B., to General Electric Company. Means and method for regulating flowrate in a vapor compression cycle device. 4,393,661, Cl. 62-113.000.
Valenta, Paul: *See—*
Golimowski, Jerzy; Sipos, Laszlo; and Valenta, Paul, 4,394,238, Cl. 204-400.000.
VALEO: *See—*
Cadars, Patrick; and Hellouin de Cenival, Bruno, 4,394,141, Cl. 55-195.000.
Vallance, Leslie: *See—*
Campbell, Bernard F.; and Vallance, Leslie, 4,393,788, Cl. 109-2.000.
Van F. Belknap Co., Inc.: *See—*
Thorn, M. W.; Thorn, E. R.; and Thorn, Brent, 4,393,734, Cl. 81-468.000.
Van Allan, James A.; Perlstein, Jerome H.; Reynolds, George A.; and Goliber, Thomas E., to Eastman Kodak Company. Photoconductive composition and elements comprising two different compounds having a dioxaborin nucleas on a derivative thereof. 4,394,428, Cl. 430-83.000.
Vandenberg, Philippe: *See—*
Mahieu, Marc; Vandenberg, Philippe; and Varon, Jacques J., 4,393,806, Cl. 118-412.000.
Van der Meiden, Orrie J.: *See—*
Muzumdar, Deepak; Mierzwa, George A.; Sanders, Richard; and Van der Meiden, Orrie J., 4,394,757, Cl. 370-100.000.
Vandermeyden, Tom R.: *See—*
Crummer, Marvin R.; Gold, Kenneth S.; Johnson, David G.; Vandermeyden, Tom R.; and Pelta, Edmond R., 4,394,742, Cl. 364-487.000.
Vanderputten, Willem: *See—*
De Briere, John G.; Lemanowicz, Mary M.; Richardson, David L.; and Vanderputten, Willem, 4,394,345, Cl. 376-245.000.
van der Schoot, Peter W. C., to Goudsche Machinefabriek B.V. Steam peeling or cooking apparatus. 4,393,756, Cl. 99-348.000.
Van Dine, Gilbert A., to Bell Telephone Laboratories, Incorporated. Voltage monitoring arrangement for ORed power diodes. 4,394,647, Cl. 340-645.000.
van Drimmelen, Nicolaas J.; Barneveld Binkhuysen, James P.; van Renssen, Johan; and Verboom, Pieter, to IHC Holland N.V. Vessel in particular suction dredger provided with means for removing oil from a water surface. 4,394,265, Cl. 210-242.300.
Van Hooreweder, Godwin J. O. G., to U. S. Philips Corporation. Device for mounting chip-type electronic components on a substrate. 4,393,579, Cl. 29-740.000.
Van Mullem, Albert, to PVBA Van Mullem. Motorbus or similar vehicle. 4,393,955, Cl. 180-291.000.
Van Nordstrand, Robert A., to Chevron Research Company. Hydrocarbons hydroprocessing with inogolite catalyst. 4,394,253, Cl. 208-251.00H.
Van Pelt, Pieter; and Lippits, Gerardus J. M., to U.S. Philips Corporation. Method of manufacturing an optically readable information carrier using deep U.V. radiation. 4,394,438, Cl. 430-321.000.
van Renssen, Johan: *See—*
van Drimmelen, Nicolaas J.; Barneveld Binkhuysen, James P.; van Renssen, Johan; and Verboom, Pieter, 4,394,265, Cl. 210-242.300.
Vansant, James H. Vapor cooled current lead for cryogenic electrical equipment. 4,394,634, Cl. 335-216.000.
van't Riet, Bartholomeus; Elford, Howard L.; and Wampler, Galen L. Hydroxybenzohydroxamic acids, benzamides and esters as ribonucleotide reductase inhibitors. 4,394,389, Cl. 424-308.000.
Van Thyne, Ray J.; and Rausch, John J., to Van Thyne, Ray J.; Rausch, John J.; and Material Sciences Corporation. Bonded structure and process of making same. 4,394,422, Cl. 428-592.000.
Vapor Corporation: *See—*
Alexander, William H., 4,393,893, Cl. 137-246.120.
Varon, Jacques J.: *See—*
Mahieu, Marc; Vandenberg, Philippe; and Varon, Jacques J., 4,393,806, Cl. 118-412.000.
Varta Batterie A.G.: *See—*
von Alpen, Ulrich; Brautigam, Reinhard; and Oliapuram, Antony, 4,394,280, Cl. 252-62.200.
VDO Adolf Schindling AG: *See—*
Mann, Arnold; and Collonia, Harald, 4,393,833, Cl. 123-335.000.
Werkmann, Karl-Heinz; and Sauerschell, Wolfgang, 4,393,724, Cl. 73-861.910.
Vdovin, Valentin M.: *See—*
Gryaznov, Vladimir M.; Smirnov, Viktor S.; Vdovin, Valentin M.; Ermilova, Margarita M.; Gogua, Liya D.; Pritula, Nina A.; and Fedorova, Galina K., 4,394,294, Cl. 252-430.000.
Veb Kombinat Polygraph "Werner Lamberz": *See—*
Janicki, Max; Liefke, Hans-Georg; Keil, Reinhart; and Geyer, Gerd, 4,394,609, Cl. 318-603.000.
Veeser, Klaus: *See—*
Krull, Manfred; Lobert, Udo; Stamm, Dieter; and Veeser, Klaus, 4,394,411, Cl. 428-70.000.
Veigel, Helmut: *See—*
Eckle, Otto; and Veigel, Helmut, 4,393,735, Cl. 82-36.00R.
Venema, Arnold: *See—*
Werner, Marcel A.; Venema, Arnold; and Pisters, Michael G. H., 4,394,470, Cl. 524-56.000.
Verber, Carl M.; Kenan, Richard P.; and Ridgway, Richard, to Canon Kabushiki Kaisha. Light beam scanning system with saw transducer. 4,394,060, Cl. 350-96.130.
Verboom, Pieter: *See—*
van Drimmelen, Nicolaas J.; Barneveld Binkhuysen, James P.; van Renssen, Johan; and Verboom, Pieter, 4,394,265, Cl. 210-242.300.
Verdier, Henri: *See—*
Bienvenu, Jacques; Dufond, Patrick; Carre, Claude; Tuong, Duc L.; Verdier, Henri; deRivet, Philippe-Hubert; Bradley, John J.; and Franklin, Benjamin S., 4,394,725, Cl. 364-200.000.
Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft: *See—*
Gschwandtner, Martin, 4,394,619, Cl. 324-117.00H.
Verhoeven, Leonardus A. J., to U.S. Philips Corporation. Device for differential image determination. 4,394,684, Cl. 358-111.000.
Vesuvius International Corporation: *See—*
Muller, Rudi; and Loser, Wolfgang, 4,393,985, Cl. 222-591.000.
Viaud, Jean, to Deere & Company. Round baler with a discharge gate for rearwardly moving a bale. 4,393,764, Cl. 100-88.000.
Vibro-Meter S.A.: *See—*
Loos, Horst-Rudolf; and Dupre, Bernard, 4,393,951, Cl. 177-136.000.
Vicon Industries, Inc.: *See—*
Randmae, Rein S.; and Whitaker, Todd H., 4,394,692, Cl. 358-229.000.
Victor Company of Japan, Limited: *See—*
Yamamoto, Toshiharu; Sato, Manabu; Akiba, Katsuya; and Abe, Koreyoshi, 4,393,540, Cl. 16-114.00R.
Victoria University of Manchester, The: *See—*
Turner, John T.; Gulati, Harish C.; Hall, William B.; and Watson, Arnold, 4,393,721, Cl. 73-861.210.
Vivitar Corporation: *See—*
Betensky, Ellis I., 4,394,072, Cl. 350-427.000.
VLI Corporation: *See—*
Vorhauer, Bruce W.; and Dobbie, Thomas A., Jr., 4,393,871, Cl. 609-58.000.
Vogel, Roger F.; Marcelin, George; and Swift, Harold E., to Gulf Research & Development Company. Process for hydrogenating aldehydes. 4,394,525, Cl. 568-462.000.
Vogelsberg, Robert E.: *See—*
Norgren, Kent S.; and Vogelsberg, Robert E., 4,394,734, Cl. 364-200.000.
Vogt, William R.: *See—*
Wynne, John M.; and Vogt, William R., 4,394,655, Cl. 340-825.360.

Volkov, Nikolai M.: *See*—
Aronov, Sergei A.; Bashilov, Vladimir A.; Volkov, Nikolai M.; and Dukhovlinov, Sergei D., 4,394,591, Cl. 310-11.000.
Volkswagenwerk Aktiengesellschaft: *See*—
Hildebrandt, Christian, 4,394,036, Cl. 280-804.000.
von Alpen, Ulrich; Brautigam, Reinhard; and Oliapuram, Antony, to Varta Batterie A.G. Ion conductive mixed crystal. 4,394,280, Cl. 252-62.200.
Vorhauer, Bruce W.; and Dobbie, Thomas A., Jr., to VLI Corporation. Vaginal device. 4,393,871, Cl. 609-58.000.
Vos, Hendrikus J. M.: *See*—
Spruijt, Aloysius M. J. M.; Wijburg, Matheus A. T.; Benschop, Gerardus C. M.; and Vos, Hendrikus J. M., 4,394,067, Cl. 350-334.000.
Vutov, Stancho H.; and Slavov, Rashko R., to Institute po Metaloznanie i Technologia na Metalite. Apparatus for pressure die casting. 4,393,916, Cl. 164-119.000.
W. G. Slow T. (a partnership): *See*—
Gardiner, William P., 4,393,829, Cl. 123-249.000.
Wachi, Masatada, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instruments of the type synthesizing a plurality of partial tone signals. 4,393,742, Cl. 84-1.230.
Wachi, Masatada, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instruments of the type synthesizing a plurality of partial tone signals. 4,393,743, Cl. 84-1.230.
Wacker-Chemie GmbH: *See*—
Huber, Peter; August, Peter; Lampelzammer, Helga; and Primas, Willi, 4,394,518, Cl. 556-424.000.
Roth, Michael; and Frey, Volker, 4,394,335, Cl. 264-82.000.
Wada, Masahiko; and Ueki, Masato, to Kabushiki Kaisha Riken. Apparatus for supplying a predetermined number of piston rings to a work station. 4,393,981, Cl. 221-289.000.
Wada, Yasuo; Usui, Hiroo; Ohkura, Makoto; Miyao, Masanobu; Tamura, Masao; and Tokuyama, Takashi, to Hitachi, Ltd. Stacked polycrystalline silicon film of high and low conductivity layers. 4,394,191, Cl. 148-33.100.
Wade, Robert C.; and Guilbault, Lawrence J., to Thiokol Corporation. Electrolytic method for producing quaternary ammonium hydroxides. 4,394,226, Cl. 204-72.000.
Wade, Robert C., to Thiokol Corporation. Alkali metal borohydride concentrate. 4,394,458, Cl. 521-82.000.
Wagener Schwelm GmbH & Co.: *See*—
Thies, Peter, 4,393,766, Cl. 100-99.000.
Wagner, Heinz: *See*—
Dosch, Werner; and Wagner, Heinz, 4,394,263, Cl. 210-198.200.
Wagner, Wilfried, to ITT Industries, Inc. Brake booster. 4,393,750, Cl. 91-376.00R.
Wagner, Wolfgang. Suction injector. 4,393,870, Cl. 604-115.000.
Wagner, Wolfgang, to U.S. Philips Corporation. Method of and device for determining the distribution of radiation absorption in a slice of a body. 4,394,738, Cl. 364-414.000.
Wagoner, Jesse W.: *See*—
Marten, John A.; Legler, Donald; and Wagoner, Jesse W., 4,393,694, Cl. 73-117.000.
Wainwright, Clyde S., Jr.: *See*—
Muse, John F.; Callihan, Rudy B.; Goad, Bobby F.; and Wainwright, Clyde S., Jr., 4,393,931, Cl. 166-208.000.
Wakamiya, Koichi, to Nippon Kogaku K.K. Compact wide angle lens. 4,394,073, Cl. 350-465.000.
Wakamiya, Yoshinori; Hamasaki, Yoshiharu; Kutsuzawa, Masaki; and Mitsubishi Denki Kabushiki Kaisha. Method of controlling continuous reheating furnace. 4,394,121, Cl. 432-11.000.
Walker, Charles D.: *See*—
Richman, David W.; and Walker, Charles D., 4,394,246, Cl. 204-301.000.
Walkowiak, Michael: *See*—
Podszun, Wolfgang; Walkowiak, Michael; and Schulz, Hans-Hermann, 4,394,465, Cl. 523-116.000.
Wallace, Edward L.; and Wright, Theodore, to United States of America, Navy. Programmable CRT brightness control. 4,394,689, Cl. 358-168.000.
Wallace, George E., to Emhart Industries, Inc. Multiple damper assembly for reach-in cases of the air defrost type. 4,393,664, Cl. 62-256.000.
Waller, Jan; and Loof, Philippus, to Shell Oil Company. Process for combusting ammonia-containing gases which also contain hydrogen sulfide. 4,394,119, Cl. 431-5.000.
Wallimann, Hubert, to Sprecher & Schuh AG. Gas-blast switch actuatable by a mechanical drive by means of a drive element. 4,394,550, Cl. 200-34.000.
Walter, John; Roth, Donald J.; and Kubis, Charles S., to Continental Group, Inc., The. Apparatus and method for applying adhesive to a container edge portion. 4,394,408, Cl. 427-231.000.
Walton, William B., to BASF Wyandotte Corporation. Stimulation of gas wells with phosphate ester surfactants. 4,393,935, Cl. 166-263.000.
Walworth Company, The: *See*—
Whitaker, Ritchie W., 4,394,003, Cl. 251-173.000.
Wampler, E. Lawrence. Swept-dip probe. 4,394,617, Cl. 324-57.00Q.
Wampler, Galen L.: *See*—
van't Riet, Bartholomeus; Elford, Howard L.; and Wampler, Galen L., 4,394,389, Cl. 424-308.000.
Wamser, Anton: *See*—
Reimpell, Uwe; Grof, Helmut; Knell, Franz-Georg; and Wamser, Anton, 4,394,765, Cl. 373-52.000.
Wamser, Manfred: *See*—
Pietzsch, Ludwig; Overlach, Knud; and Wamser, Manfred, 4,393,698, Cl. 73-118.000.
Wang, Han C.: *See*—
Cuomo, Jerome J.; Landon, Alfred J.; and Wang, Han C., 4,393,967, Cl. 192-84.00E.
Landon, Alfred J.; Pennebaker, William B.; and Wang, Han C., 4,393,769, Cl. 101-93.300.
Wang, Kenneth Y.; and Hill, Berlie R., to Burlington Industries, Inc. Ultrasonic bonding. 4,394,208, Cl. 156-580.100.
Wang, Samuel S.; and Scanlon, Michael J., to American Cyanamid Company. Froth flotation process. 4,394,257, Cl. 209-166.000.
Wang, Taylor G.: *See*—
Barmatz, Martin B.; Trinh, Eugene H.; Wang, Taylor G.; Elleman, Daniel D.; and Jacobi, Nathan, 4,393,708, Cl. 73-505.000.
Warabi, Junichi; Sakuma, Shinzo; Kawaguchi, Hidemi; and Kobari, Yukio, to Kabushiki Kaisha Meidensha. Vacuum circuit interrupter. 4,394,554, Cl. 200-144.00B.
Ward, Fred A. Kneeling aid device. 4,394,049, Cl. 297-439.000.
Warman International Limited: *See*—
Gugger, Hans; and Ackland, John, 4,393,944, Cl. 173-28.000.
Warnecke, Waldemar, to Friedrich Wilh. Schwing GmbH. Excavator with laser position indicator. 4,393,606, Cl. 37-103.000.
Warnock, Charles E., Sr. Apparatus for use in rejuvenating oil wells. 4,393,928, Cl. 166-105.000.
Warren, Ben; White, George M.; Parfitt, Rick; and Deng, Peter, to Threshold Technology, Inc. Speech recognition system and method. 4,394,538, Cl. 179-1.05D.
Wasel-Nielen, Horst-Dieter; Maurer, Alexander; and Adrian, Renate, to Hoechst Aktiengesellschaft. Process for making granulated condensed phosphates. 4,394,359, Cl. 423-305.000.
Watanabe, Haruzo: *See*—
Yamamoto, Hideomi; Watanabe, Haruzo; Kishie, Hidehiko; and Nishihara, Toshio, 4,394,412, Cl. 428-174.000.
Watanabe, Kazuo: *See*—
Makabe, Hachiro; Watanabe, Kazuo; Takenoya, Hideaki; Kume, Toshiaki; and Kakinuma, Toshihide, 4,393,795, Cl. 112-158.00E.
Watanabe, Kunio: *See*—
Ozawa, Masakazu; Watanabe, Kunio; Matsumoto, Shigeyuki; Nishimura, Yukuo; and Miyazaki, Takashi, 4,394,669, Cl. 346-140.00R.
Senuma, Michio; and Watanabe, Kunio, 4,394,082, Cl. 354-246.000.
Watanabe, Makoto: *See*—
Okamoto, Tadaomi; Ohta, Masayuki; and Watanabe, Makoto, 4,394,772, Cl. 378-182.000.
Watanabe, Nobuyuki: *See*—
Satoh, Kiyosumi; and Watanabe, Nobuyuki, 4,394,735, Cl. 364-200.000.
Watanabe, Seiichi: *See*—
Ohtani, Hiroo; and Watanabe, Seiichi, 4,394,187, Cl. 148-12.00F.
Watanabe, Toshiro, to Matsushita Electric Industrial Co., Ltd. Color television signal processing apparatus. 4,394,680, Cl. 358-22.000.
Watanabe, Tsuyoshi: *See*—
Saito, Takashi; Sakurayama, Junichi; and Watanabe, Tsuyoshi, 4,394,431, Cl. 430-119.000.
Waters, Kenneth H., to Conoco Inc. Apparatus for low frequency torsional shear wave logging. 4,394,754, Cl. 367-75.000.
Watkins, Richard R.: *See*—
Long, Nicholas R.; Peisel, William E.; Ryan, Joseph L.; and Watkins, Richard R., 4,394,650, Cl. 340-728.000.
Watkins, Robert G., Jr. Tractor-trailer land vehicle. 4,394,027, Cl. 280-5.00C.
Watkins, Thomas I.: *See*—
Copping, Leonard G.; Kerry, John C.; Watkins, Thomas I.; Willis, Robert J.; and Palmer, Bryan H., 4,394,387, Cl. 424-300.000.
Watson, Arnold: *See*—
Turner, John T.; Gulati, Harish C.; Hall, William B.; and Watson, Arnold, 4,393,721, Cl. 73-861.210.
Watson, Peter M. F.: *See*—
Armour, John S.; Watson, Peter M. F.; and Donne, Graham L., 4,393,980, Cl. 220-85.00S.
Wattles, Gurdon B.: *See*—
Marro, Joseph, Jr.; and Wattles, Gurdon B., 4,394,131, Cl. 44-51.000.
Wavin B.V.: *See*—
Kuibers-Kiewik, Walfrida G. E.; Akkerman, Johann; and Gons, Johan, 4,394,501, Cl. 528-485.000.
Weaver, Edgar C.: *See*—
Ried, Harold T.; and Weaver, Edgar C., 4,394,195, Cl. 148-149.000.
Weaver, Jon N.: *See*—
Humble, David R.; Weaver, Jon N.; Gentzler, David L.; Eskandry, Ezra D.; and Lamanna, Peter J., 4,394,645, Cl. 340-572.000.
Weaver, Robert F., to Emhart Industries, Inc. Stator arrangement for a synchronous motor. 4,394,595, Cl. 310-162.000.
Wehr Corporation: *See*—
Zerbel, Allen J., 4,394,561, Cl. 219-285.000.
Weiffen, Karl-Heinz: *See*—
Heintges, Siegfried; Strauss, Werner; and Weiffen, Karl-Heinz, 4,394,260, Cl. 209-500.000.
Weinberg, Kurt; and Johnson, Gordon C., to Union Carbide Corporation. Coordination complexes as polyesterification catalysts. 4,394,295, Cl. 252-431.00C.
Weiss, Hermann; Klotz, Erhard; Peemoller, Horst; Linde, Rolf; and Mauser, Wilfried, to U.S. Philips Corporation. Device for reconstructing layer images of a three-dimensional object by means of an adjustable imaging matrix. 4,394,063, Cl. 350-162.130.
Weiss, Melvin P.: *See*—
Nygard, James C.; Weiss, Melvin P.; and Larsen, Thomas E., 4,393,804, Cl. 118-60.000.

Weissman, Bernard, to Ipco Corporation. Overhandle for enclosing a dental tool handle or shank. 4,393,539, Cl. 16-114.00R.

Weissman, Sherman M.; Pereira, Dennis; and Sood, Ashwani, to Yale University. Method for cloning genes. 4,394,443, Cl. 435-6.000.

Weitz, Hans-Martin: *See*—
Schnabel, Rolf; Weitz, Hans-Martin; and Fischer, Rolf, 4,394,290, Cl. 252-412.000.

Welber, Stanley: *See*—
Reznik, Benjamin; Welber, Stanley; and Streifeneder, Ludwig, 4,393,872, Cl. 604-151.000.

Welsh, Clifford W. Food pouch cooking holder. 4,393,757, Cl. 99-369.000.

Werkmann, Karl-Heinz; and Sauerschell, Wolfgang, to VDO Adolf Schindling AG. Flow meter having a rotary body. 4,393,724, Cl. 73-861.910.

Werner, Marcel A.; Venema, Arnold; and Pisters, Michael G. H., to Akzo N.V. Colored polyethylene terephthalate moulding compound and moulded products made therefrom. 4,394,470, Cl. 524-56.000.

Werner, Peter: *See*—
Drews, Ulrich; Werner, Peter; and Mohrle, Werner, 4,393,841, Cl. 123-440.000.

Werner, Richard W.; and Hoffman, Myron A. Heat pipes for use in a magnetic field. 4,394,344, Cl. 376-146.000.

West Electric Co., Ltd.: *See*—
Yoshino, Tsunemi; Kashihara, Toshitsugu; Iwata, Hiroshi; and Morioka, Akitoshi, 4,394,077, Cl. 354-25.000.

West, Trent W. Adjustable trampoline type pool and hot tub cover. 4,393,528, Cl. 4-498.000.

Western Electric Co., Inc.: *See*—
Apgar, Waldo D.; Davis, Charles L.; Emery, Loring D., Jr.; Esseluhn, Werner F.; and Holbrook, Walter R., 4,394,602, Cl. 315-71.000.
Arnold, William S., Jr.; and Tulloss, Joseph C., 4,393,582, Cl. 29-828.000.
Fuchs, Francis J., Jr., 4,393,917, Cl. 164-476.000.

Westhead, William T., to Scapa Dryers, Inc. Flame retardant dryer fabrics. 4,394,413, Cl. 428-257.000.

Westinghouse Electric Corp.: *See*—
Brennen, Michael B.; Gyugyi, Laszlo; and Stacey, Eric J., 4,394,614, Cl. 323-210.000.
Fry, Warren C.; Franz, James H.; and Merlino, Paul J., 4,394,724, Cl. 363-124.000.
Klein, Gerald I., 4,394,633, Cl. 333-238.000.
Pebler, Alfred R., 4,394,240, Cl. 204-412.000.

Weyerhaeuser Company: *See*—
Hertel, James E., 4,394,409, Cl. 428-36.000.

Wheelwright, Joseph S. Skate. 4,394,028, Cl. 280-11.190.

Whetten, Nathan R.: *See*—
Houston, John M.; and Whetten, Nathan R., 4,394,578, Cl. 250-374.000.

Whillier, Austin: *See*—
Thimons, Edward D.; Heller, Kenneth S.; McCoy, John F., III; and Whillier, Austin, 4,394,142, Cl. 55-242.000.

Whippen, Warren G.: *See*—
Wirschal, Helmut H.; and Whippen, Warren G., 4,394,098, Cl. 405-77.000.

Whirlpool Corporation: *See*—
Williams, Robert R., 4,394,643, Cl. 340-365.00C.

Whitaker, Ritchie W., to Walworth Company, The. Cryogenic butterfly valve with bi-directional sealing capability. 4,394,003, Cl. 251-173.000.

Whitaker, Todd H.: *See*—
Randmae, Rein S.; and Whitaker, Todd H., 4,394,692, Cl. 358-229.000.

White, Fred K., to American Hospital Supply Corporation. Method and device for collecting, transporting, and delivering micro samples of blood. 4,393,882, Cl. 128-764.000.

White, George M.: *See*—
Warren, Ben; White, George M.; Parfitt, Rick; and Deng, Peter, 4,394,538, Cl. 179-1.0SD.

White, Sidney S., Jr.: *See*—
Bresser, Robert E.; White, Sidney S., Jr.; and Koeniger, Arthur F., 4,394,325, Cl. 260-446.000.

White-Stevens, Rodric H.: *See*—
Cameron, Erma C.; Gunter, Claude R.; and White-Stevens, Rodric H., 4,394,444, Cl. 435-11.000.

Whittle, Danny J.: *See*—
Heckethorn, John E.; and Whittle, Danny J., 4,393,559, Cl. 24-277.000.

Widen, Bo G., to GKN Stenman AB. Cylinder lock. 4,393,673, Cl. 70-358.000.

Widergren, Robert D.; Chen, Wen-Hsiung; Fralick, Stanley C.; and Tescher, Andrew G., to Compression Labs, Inc. Digital video compression system and methods utilizing scene adaptive coding with rate buffer feedback. 4,394,774, Cl. 382-56.000.

Widmayer, Don F., to Controlled Environment Systems Inc. Energy conserving automatic light output system. 4,394,603, Cl. 315-311.000.

Wieczorek, Alfred B.: *See*—
Borras, Jaime A.; Gonzalez, Ruben J.; Smith, Daniel M.; and Wieczorek, Alfred B., 4,394,776, Cl. 455-76.000.

Wiegand, Walter J.; and Bullis, Robert H., to United Technologies Corporation. Ionization flowmeter. 4,393,719, Cl. 73-861.050.

Wier, Franz, to Repa Feinstanzwerk GmbH. Locking device for a safety belt. 4,393,553, Cl. 24-230.0AL.

Wier, Franz, to Repa Feinstanzwerk GmbH. Locking device for safety belts. 4,393,554, Cl. 24-230.0AL.

Wierschke, Donald J., to RCA Corporation. Method to center and separate electroformed replicas from a matrix. 4,394,341, Cl. 264-225.000.

Wiese, John M.; and Hoeffken, Russell W., to Snyder General Corporation. Top cover, motor, fan and fan shroud assembly for an air conditioning unit. 4,394,111, Cl. 417-360.000.

Wijburg, Matheus A. T.: *See*—
Spruijt, Aloysius M. J. M.; Wijburg, Matheus A. T.; Benschop, Gerardus C. M.; and Vos, Hendrikus J. M., 4,394,067, Cl. 350-334.000.

Wilber, Scott A., to Bios Technology, Inc. Photodetector having an electrically conductive, selectively transmissive window. 4,394,572, Cl. 250-239.000.

Wilcockson, Brian: *See*—
Briner, Clifton F.; Bocchini, William R.; and Wilcockson, Brian, 4,393,524, Cl. 4-317.000.

Wilhelm Schmidding GmbH & Co., Firma: *See*—
Stage, Hermann; Hammer, Hartmut; and Kuhns, Walter, 4,394,221, Cl. 203-89.000.

Wilke, Douglas A., to United States of America, Agriculture. Solar air duct. 4,393,862, Cl. 126-448.000.

Wilkinson, Christopher J.: *See*—
Yeomans, David; Wilkinson, Christopher J.; McCartney, Damien; and O'Dwyer, Micheal, 4,394,685, Cl. 358-264.000.

William L. Bonnell Company, The: *See*—
Kennedy, James A., 4,394,166, Cl. 75-65.00R.

Williams, James; and Wills, Henry K., to Automation Industries, Inc. Double-molded electrical end fitting assembly. 4,394,057, Cl. 339-15.000.

Williams, Robert R., to Whirlpool Corporation. Capacitive touch panel control. 4,394,643, Cl. 340-365.00C.

Willingham, Wendell D., to Owens-Illinois, Inc. Child resistant package. 4,393,977, Cl. 215-211.000.

Willis, Alan E.; Lowdenslager, John R.; and Goldstein, Neal, to Timex Corporation. Remote meter reader and method for reading meters over non-dedicated telephone lines. 4,394,540, Cl. 179-2.0AM.

Willis, Frederick G.; Radtke, Richard R.; Ellison, Joseph; and Fozo, Steven R., to Ford Motor Company. Method for generating energy output signal. 4,393,696, Cl. 73-117.300.

Willis, Robert J.: *See*—
Copping, Leonard G.; Kerry, John C.; Watkins, Thomas I.; Willis, Robert J.; and Palmer, Bryan H., 4,394,387, Cl. 424-300.000.

Willms, Rolf: *See*—
Haese, Egon; Willms, Rolf; and Schultheiss, Karl D., 4,394,363, Cl. 423-356.000.

Wills, Henry K.: *See*—
Williams, James; and Wills, Henry K., 4,394,057, Cl. 339-15.000.

Wilson, Donald C., to FMC Corporation. Method for removing rot from potatoes. 4,394,398, Cl. 426-481.000.

Wilson, Douglas D.: *See*—
Allen, Walter E.; and Wilson, Douglas D., 4,393,998, Cl. 248-74.00R.

Wilson, James G., II; and Hammers, P. Fred, to Wilson Welding Company, Inc. Method of making a water-cooled electrode holder. 4,393,565, Cl. 29-157.30R.

Wilson, James H. Coin-controlled vending apparatus. 4,393,971, Cl. 194-93.000.

Wilson, John P.: *See*—
Bergendahl, Albert S.; Hakey, Mark C.; and Wilson, John P., 4,394,437, Cl. 430-312.000.

Wilson, Robert B. Diester composition and textile processing compositions therefrom. 4,394,126, Cl. 8-115.600.

Wilson, Thomas E., to Rockwell International Corporation. Gear shift mechanism. 4,393,729, Cl. 74-475.000.

Wilson Welding Company, Inc.: *See*—
Wilson, James G., II; and Hammers, P. Fred, 4,393,565, Cl. 29-157.30R.

Wimnell, Nils E.: *See*—
Gasparini, Aldo; and Wimnell, Nils E., 4,393,629, Cl. 52-74.000.

Wimnell, Nils Erik: *See*—
Gasparini, Aldo; and Wimnell, Nils E., 4,393,629, Cl. 52-74.000.

Winchell, Vern H., II; Scharr, Thomas A.; and Clark, Lowell E., to Motorola, Inc. Elevated edge-protected bonding pedestals for semiconductor devices. 4,394,678, Cl. 357-68.000.

Winfield, Mason C., to Astronics Corporation. Safety liner for tires. 4,393,911, Cl. 152-158.000.

Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG: *See*—
Heyden, Gunter, 4,393,738, Cl. 83-663.000.

Winter, John P.; and Tomic, Mladomir, to Coca-Cola Company, The. Rubber compounding bags and film made from syndiotactic 1,2-polybutadiene. 4,394,473, Cl. 524-226.000.

Wirschal, Helmut H.; and Whippen, Warren G., to Allis-Chalmers Corporation. Radial gate having fine tuning of flow control. 4,394,098, Cl. 405-77.000.

Wisniewski, Joseph M., to Haworth, Inc. Height-adjusting mechanism for chair seat. 4,394,001, Cl. 248-542.000.

Wittes, James M.: *See*—
Lane, Ronald S.; and Wittes, James M., 4,393,611, Cl. 40-107.000.

Wium, Eigil: *See*—
Gajajiva, Padej; and Wium, Eigil, 4,393,900, Cl. 138-89.000.

Wnek, Gary E., to Massachusetts Institute of Technology. Electrically conducting polymer blends. 4,394,304, Cl. 252-520.000.

Woell, William J. Roller table for use with a power saw. 4,393,969, Cl. 193-35.0TE.

Woerwag, Peter, to Dupro A.G. Speed control circuit for electric motor. 4,394,606, Cl. 318-434.000.
Wolcott, John M.: *See—*
Lometillo, Josephine E.; and Wolcott, John M., 4,394,397, Cl. 426-557.000.
Wolfe, Ralph S.: *See—*
Blakemore, Richard P.; and Wolfe, Ralph S., 4,394,451, Cl. 435-253.000.
Wollar, Burnell J.; and Schwind, Richard J., to Phillips Plastics Corp. Rotatably engaging head for fastener. 4,393,551, Cl. 24-213.00R.
Woo, Dae-Shik: *See—*
Policastro, Steven G.; and Woo, Dae-Shik, 4,393,572, Cl. 29-571.000.
Woodling, George V. Combination roller tooth set having roller teeth and concave surfaces disposed to engage each other. 4,394,112, Cl. 418-61.00B.
Worns, John R.: *See—*
Farber, Milton; and Worns, John R., 4,394,435, Cl. 430-287.000.
Worthington, Paul A.: *See—*
de Fraine, Paul; Clough, John M.; and Worthington, Paul A., 4,394,151, Cl. 71-76.000.
Wren, Paul E., to United States of America, National Aeronautics and Space Administration. Method of and system for classifying emergency locating transmitters and emergency positions indicating radio beacons. 4,394,777, Cl. 455-95.000.
Wrench, Edwin H., Jr., to United States of America, Navy. Real-time amplitude histogram shaper. 4,394,744, Cl. 364-553.000.
Wright, Theodore: *See—*
Wallace, Edward L.; and Wright, Theodore, 4,394,689, Cl. 358-168.000.
Wuerzer, Bruno: *See—*
Eicken, Karl; Rohr, Wolfgang; and Wuerzer, Bruno, 4,394,513, Cl. 548-374.000.
Wulf, Helmut: *See—*
Bahrle, Friedrich; and Wulf, Helmut, 4,393,922, Cl. 165-41.000.
Wurcel, Jacques: *See—*
Reinstein, Martine; and Wurcel, Jacques, 4,393,667, Cl. 63-29.00R.
Wurlitzer Company, The: *See—*
Niezgoda, Thomas A.; and Oppenheimer, Carl P., 4,393,740, Cl. 84-1.010.
Wynne, John M.; and Vogt, William R., to Baker Industries, Inc. Bidirectional, interactive fire detection system. 4,394,655, Cl. 340-825.360.
Xerox Corporation: *See—*
Cheng, David; and Chai, Stephen T., 4,394,667, Cl. 346-137.000.
Hays, Dan A., 4,394,429, Cl. 430-102.000.
Hoffman, James M., Jr.; and Lux, Richard A., 4,394,086, Cl. 355-3.00R.
Rees, James D., 4,394,083, Cl. 355-1.000.
Yale University: *See—*
Weissman, Sherman M.; Pereira, Dennis; and Sood, Ashwani, 4,394,443, Cl. 435-6.000.
Yamada, Tateo: *See—*
Kimura, Hirovuki; and Yamada, Tateo, 4,394,080, Cl. 354-173.000.
Yamada, Yasuharu; and Kawai, Kiyoshi, to Sumitomo Chemical Company, Limited. Catalysts for the polymerization of olefins. 4,394,292, Cl. 252-429.00B.
Yamada, Yasuyuki, to Canon Kabushiki Kaisha. Lens system with fill-in lens. 4,394,071, Cl. 350-422.000.
Yamaguchi, Kathuhiro: *See—*
Shimizu, Yoshikazu; and Yamaguchi, Kathuhiro, 4,394,416, Cl. 428-341.000.
Yamaguchi, Sizuka: *See—*
Asahi, Naotatsu; Yamaguchi, Sizuka; and Terakado, Katsuyoshi, 4,394,234, Cl. 204-164.000.
Yamamoto, Hideaki: *See—*
Tsukada, Toshihisa; Takasaki, Yukio; Hirai, Tadaaki; Baji, Toru; Yamamoto, Hideaki; Tanaka, Yasuo; Maruyama, Eiichi; and Ishioka, Sachio, 4,394,749, Cl. 365-106.000.
Yamamoto, Hideomi; Watanabe, Haruzo; Kishie, Hidehiko; and Nishihara, Toshio, to Matsushita Electric Works, Ltd. Composite member comprising metallic sheet bent to be arcuate in section and rigid synthetic resin coating. 4,394,412, Cl. 428-174.000.
Yamamoto, Toshiharu; Sato, Manabu; Akiba, Katsuya; and Abe, Koreyoshi, to Victor Company of Japan, Limited. Detachable handle having a pivotal part. 4,393,540, Cl. 16-114.00R.
Yamazaki, Hisashi: *See—*
Takahashi, Kenji; Yamazaki, Hisashi; Miyahara, Junji; Kotera, Noboru; Eguchi, Shusaku; and Miura, Norio, 4,394,581, Cl. 250-484.100.
Yang, James; and Chen, James M. F. Safety clasp for the string of footwear. 4,393,550, Cl. 24-117.000.
Yasuda, Atsuyuki: *See—*
Fujimura, Shuzo; and Yasuda, Atsuyuki, 4,393,807, Cl. 118-501.000.
Yasuda, Tadahiro: *See—*
Nishikawa, Masaji; Amemiya, Norio; Yasuda, Tadahiro; and Nakayama, Shigeru, 4,394,427, Cl. 430-68.000.
Yasuta, Naoshi; Matsumura, Yoshio; and Kotani, Teizo, to Japan Synthetic Rubber Co., Ltd. Process for treating acetylene polymer or doped acetylene polymer. 4,394,402, Cl. 427-40.000.
Ye Data Inc.: *See—*
Tatsumi, Juichi, 4,393,771, Cl. 101-93.480.
Yeargin, G. Scott: *See—*
Malpass, Dennis B.; and Yeargin, G. Scott, 4,394,326, Cl. 260-448.0AD.
Yeomans, David; Wilkinson, Christopher J.; McCartney, Damien; and O'Dwyer, Micheal, to Centronics Data Computer Corporation. Interface for operating a dot matrix printer for printing a video image. 4,394,685, Cl. 358-264.000.
Yoshida, Hiroshi: *See—*
Izumi, Masao; Yoshida, Hiroshi; and Yoshikawa, Yukio, 4,393,897, Cl. 137-831.000.
Izumi, Masao; Yoshida, Hiroshi; and Yoshikawa, Yukio, 4,393,898, Cl. 137-831.000.
Yoshida, Kazunori, to Nippon Electric Co., Ltd. Self-supporting capacitor casing having a pair of terminal plates sandwiching an insulative body for aligning terminal positions. 4,394,713, Cl. 361-433.000.
Yoshida, Kunio; Kotera, Hiroaki; Tsuda, Yukifumi; Kanno, Yoshimitsu; and Naka, Motohiko, to Matsushita Research Institute Tokyo, Inc. Dot printer for reproduction of halftone images. 4,394,662, Cl. 346-33.00R.
Yoshida, Masaru: *See—*
Takeda, Mikio; Kakihara, Yoshinobu; Yoshida, Masaru; and Nakata, Yukihiko, 4,394,601, Cl. 313-509.000.
Yoshida, Motoaki: *See—*
Fujioka, Akira; Sakiyama, Kazuo; Takigawa, Akio; and Yoshida, Motoaki, 4,394,177, Cl. 106-287.140.
Yoshikawa, Yukio: *See—*
Izumi, Masao; Yoshida, Hiroshi; and Yoshikawa, Yukio, 4,393,897, Cl. 137-831.000.
Izumi, Masao; Yoshida, Hiroshi; and Yoshikawa, Yukio, 4,393,898, Cl. 137-831.000.
Yoshimaru, Tomohisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for positioning magnetic head to position corresponding to reference track on magnetic tape. 4,394,696, Cl. 360-78.000.
Yoshimura, Noboru: *See—*
Sakurai, Kenji; and Yoshimura, Noboru, 4,394,048, Cl. 297-367.000.
Yoshino, Tsunemi; Kashihara, Toshitsugu; Iwata, Hiroshi; and Morioka, Akitoshi, to West Electric Co., Ltd. Device for detecting sharp focusing. 4,394,077, Cl. 354-25.000.
Yoshioka, Akiteru: *See—*
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,394,384, Cl. 424-246.000.
Yu, SePuan: *See—*
Cady, William R.; Yu, SePuan; and Eshbach, John R., 4,393,578, Cl. 29-576.00B.
Yuda, Takuo; and Mizusawa, Akira, to Nifco, Inc. Plastic buckle. 4,393,556, Cl. 24-230.00R.
Yuda, Takuo, to Nifco, Inc. Radiator grille fixing structure. 4,393,561, Cl. 24-297.000.
Zacharin, Alexey T., to United States of America, Army. Omni directional fuze. 4,393,780, Cl. 102-255.000.
Zagranski, Raymond D.: *See—*
Peck, Robert E.; and Zagranski, Raymond D., 4,393,651, Cl. 60-39.281.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
Umezawa, Hamao; Shimada, Nobuyoshi; Naganawa, Hiroshi; Takita, Tomohisa; Hamada, Masa; and Takeuchi, Tomio, 4,394,446, Cl. 435-88.000.
Zaromb, Solomon: *See—*
Di Leo, Angela M.; and Lucia, James, 4,394,644, Cl. 340-571.000.
Zbinden, Terry B., to Sperry Corporation. Circuit controlling coolant flow to a non-linear heat exchanger through a non-linear electromechanical valve. 4,393,921, Cl. 165-40.000.
Zemelman, Valery B.: *See—*
Kleiner, Fredric; and Zemelman, Valery B., 4,393,660, Cl. 62-69.000.
Zenith Radio Corporation: *See—*
Rowe, William A., 4,394,681, Cl. 358-60.000.
Zerbel, Allen J., to Wehr Corporation. Tank structure for an air humidifying electrode steam generator. 4,394,561, Cl. 219-285.000.
Zils, James A.: *See—*
Hess, George M.; and Zils, James A., 4,393,787, Cl. 105-199.0CB.
Zimmermann, Guido: *See—*
Kille, Ewald; and Zimmermann, Guido, 4,393,993, Cl. 239-332.000.
Zipperian, Donald E., to Diester Concentrator Co., Inc., The. Froth flotation apparatus with water recovery and method. 4,394,258, Cl. 209-170.000.
Zouzoulas, John, to Andco Actuator Products, Inc. Rotary actuator. 4,393,965, Cl. 192-48.910.
Zscheile, John W., Jr.: *See—*
Currie, Robert J.; Rattlingourd, Glen D.; Spencer, Billie M.; and Zscheile, John W., Jr., 4,394,642, Cl. 340-347.0DD.
Zurn Industries, Inc.: *See—*
Bukowski, Ronald G.; and Johnson, Timothy L., 4,394,262, Cl. 210-103.000.
Zwald, Henry J., to Motorola Inc. Anti-torque connection apparatus and method for using. 4,393,583, Cl. 29-857.000.
Zweig, Arnold: *See—*
Fischer, Robert G., Jr.; and Zweig, Arnold, 4,394,527, Cl. 570-143.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF JULY, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bell Telephone Laboratories, Incorporated: *See*—
Fraser, Alexander G., Re. 31,319, Cl. 370-80.000.

Blacksher, Roy: *See*—
Kaufman, Phillip A.; Gorman, Kenneth C.; Henry, George C.; and Blacksher, Roy, Re. 31,318, Cl. 364-200.000.

Blaha, James G., to Towmotor Corporation. Brake drum seal with dual elastomeric legs. Re. 31,314, Cl. 277-84.000.

Cannon, Raymond E.: *See*—
Jenkins, Jon A.; and Cannon, Raymond E., Re. 31,315, Cl. 417-63.000.

Computer Automation, Inc.: *See*—
Kaufman, Phillip A.; Gorman, Kenneth C.; Henry, George C.; and Blacksher, Roy, Re. 31,318, Cl. 364-200.000.

Eddens, Gerald R., to W. J. Industries, Inc. Tension monitor means. Re. 31,312, Cl. 73-862.480.

Fraser, Alexander G., to Bell Telephone Laboratories, Incorporated. Digital data communication system. Re. 31,319, Cl. 370-80.000.

Fredd, John V.; and Sizer, Phillip S., to Otis Engineering Corporation. Method and system for well testing. Re. 31,313, Cl. 166-250.000.

Gorman, Kenneth C.: *See*—
Kaufman, Phillip A.; Gorman, Kenneth C.; Henry, George C.; and Blacksher, Roy, Re. 31,318, Cl. 364-200.000.

Henry, George C.: *See*—
Kaufman, Phillip A.; Gorman, Kenneth C.; Henry, George C.; and Blacksher, Roy, Re. 31,318, Cl. 364-200.000.

Imaizumi, Nobuo; and Wakana, Kazuo, to Namiki Precision Jewel Co., Ltd. Rare earth-cobalt system permanent magnetic alloys and method of preparing same. Re. 31,317, Cl. 148-103.000.

Imed Corporation: *See*—
Jenkins, Jon A.; and Cannon, Raymond E., Re. 31,315, Cl. 417-63.000.

Jenkins, Jon A.; and Cannon, Raymond E., to Imed Corporation. Apparatus for converting a pump to a controller. Re. 31,315, Cl. 417-63.000.

Kaufman, Phillip A.; Gorman, Kenneth C.; Henry, George C.; and Blacksher, Roy, to Computer Automation, Inc. Automatic modular memory address allocation system. Re. 31,318, Cl. 364-200.000.

Moore, Robert W. Elongated igniting device. Re. 31,316, Cl. 431-254.000.

Namiki Precision Jewel Co., Ltd.: *See*—
Imaizumi, Nobuo; and Wakana, Kazuo, Re. 31,317, Cl. 148-103.000.

Otis Engineering Corporation: *See*—
Fredd, John V.; and Sizer, Phillip S., Re. 31,313, Cl. 166-250.000.

Sizer, Phillip S.: *See*—
Fredd, John V.; and Sizer, Phillip S., Re. 31,313, Cl. 166-250.000.

Towmotor Corporation: *See*—
Blaha, James G., Re. 31,314, Cl. 277-84.000.

W. J. Industries, Inc.: *See*—
Eddens, Gerald R., Re. 31,312, Cl. 73-862.480.

Wakana, Kazuo: *See*—
Imaizumi, Nobuo; and Wakana, Kazuo, Re. 31,317, Cl. 148-103.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Nester, Francis M., to K. S. Industries, Inc. Hopper gate latching mechanism. B1 3,707,126, Cl. 105—282 P.

K. S. Industries, Inc.: *See*—
Nester, Francis M. B1 3,707,126, Cl. 105—282 P.

McCall, Francis J. Apparatus for acupressure treatment. B1 4,073,296, Cl. 128—303 R.

Mandelcorn, Lyon; Miller, Robert L; Mercier, George E.; Pickett, John H.; and Dakin, Thomas W., to Westinghouse Electric Corporation. Capacitor. B1 4,054,937, Cl. 361—315.

Westinghouse Electric Corporation: *See*—
Mandelcorn, Lyon; Miller, Robert L.; Mercier, George E.; Pickett, John H.; and Dakin, Thomas W. B1 4,054,937, Cl. 361—315.

LIST OF DESIGN PATENTEES

AB SKF: *See*—
Ostling, Sture, 269,786, Cl. D15-143.000.

Alessio, Frank. Teaching clock. 269,790, 7-19-83, Cl. D19-64.000.

Alexander, Roy P.; Sangster, Arlon G.; and Green, Joseph C., to Olin Corporation. Swimming pool chemical dispenser or the like. 269,802, 7-19-83, Cl. D23-03.000.

Aliseo Diffusion S.A.: *See*—
Froidevaux, Jean-Marie, 269,819, Cl. D28-12.000.

Ament, Donald S., to Miracle Recreation Equipment Company. Light fixture. 269,818, 7-19-83, Cl. D26-73.000.

AMF Incorporated: *See*—
Hahn, Daniel G., 269,772, Cl. D12-110.000.

Amos, Homer C., to Brunswick Corporation. Ball catching and throwing device. 269,794, 7-19-83, Cl. D21-210.000.

Amos, Homer C., to Brunswick Corporation. Ball catching and throwing device. 269,795, 7-19-83, Cl. D21-210.000.

Anderson, David. Fireplace grate. 269,803, 7-19-83, Cl. D23-95.000.

Aqua-Mist, Inc.: *See*—
Morrow, William E.; and Morrow, Robert B., 269,807, Cl. D23-139.000.

Ayres, Margaret E. Cane. 269,733, 7-19-83, Cl. D3-7.000.

Barthel, John E., to Dahl-Braden, Chapman Architects, Inc. Automatic teller machine kiosk. 269,822, 7-19-83, Cl. D99-28.000.

Barthel, John E., to First International Services Corporation. Automatic teller machine booth for mounting on a wall. 269,823, 7-19-83, Cl. D99-28.000.

Baser, Benjamin T. Hoop roller. 269,792, 7-19-83, Cl. D21-101.000.

Bendix Corporation, The: *See*—
Williams, Robert L., 269,777, Cl. D13-1.000.

Berkline Corporation, The: *See*—
Brooks, Richard, 269,746, Cl. D6-63.000.
Long, Stapleton, 269,745, Cl. D6-63.000.

Berlic, France. Chair. 269,748, 7-19-83, Cl. D6-76.000.

Bevilacqua, John E., Jr.; and Ross, James E., to United Artists Corporation. Telephone. 269,779, 7-19-83, Cl. D14-53.000.

Bisson, Nicole, to Salon Nicole Bisson Inc. Hairdresser comb. 269,820, 7-19-83, Cl. D28-25.000.

Bolyn, Anthony E., to Congoleum Corporation. Display stand for floor tiles, carpets or similar article. 269,750, 7-19-83, Cl. D6-85.000.

Bolyn, Anthony E., to Congoleum Corporation. Display cabinet for floor tiles, carpets or similar article. 269,752, 7-19-83, Cl. D6-168.000.

Boonstra, Robert M.: *See—*
Mace, Leslie E.; Jones, Paul W.; and Boonstra, Robert M., 269,810, Cl. D24-17.000.

BP Oil Limited: *See—*
Grant, Andrew, 269,762, Cl. D9-375.000.

Braswell, Charles A., to Jaro, Inc. Bar-b-que shell. 269,758, 7-19-83, Cl. D7-337.000.

Brooks, Richard, to Berkline Corporation, The. Settee. 269,746, 7-19-83, Cl. D6-63.000.

Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., to Simmons Universal Corporation. Crib. 269,742, 7-19-83, Cl. D6-16.000.

Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., to Simmons Universal Corporation. Crib footboard. 269,757, 7-19-83, Cl. D6-198.000.

Brunswick Corporation: *See—*
Amos, Homer C., 269,794, Cl. D21-210.000.
Amos, Homer C., 269,795, Cl. D21-210.000.
Fee, Robert W.; Robbins, Richard J.; and Neufeld, Henry L., 269,798, Cl. D22-25.000.

Bunetta, Brian T. Compartmented travel case. 269,735, 7-19-83, Cl. D3-39.000.

Camp International, Inc.: *See—*
Meier, Robert H.; and Farr, Evelyn, 269,816, Cl. D24-64.000.

Canning, Daniel; and Jordan, James B., to Qume Corporation. Printer. 269,782, 7-19-83, Cl. D14-111.000.

Chadd, Charles W. Combined portable vent and support for a clothes dryer. 269,809, 7-19-83, Cl. D23-151.000.

Chatham, Richard W. Compartmented tray for drafting supplies. 269,791, 7-19-83, Cl. D19-77.000.

Clover Mfg. Co., Ltd.: *See—*
Okada, Hidekazu, 269,734, Cl. D3-28.000.

Congoleum Corporation: *See—*
Bolyn, Anthony E., 269,750, Cl. D6-85.000.
Bolyn, Anthony E., 269,752, Cl. D6-168.000.

Consolidated Foods Corporation: *See—*
DiTullio, Flavia, 269,730, Cl. D2-24.000.

Cosden Technology, Inc.: *See—*
Fortuna, Vincent E., 269,763, Cl. D9-398.000.
Fortuna, Vincent E., 269,764, Cl. D9-398.000.
Fortuna, Vincent E., 269,765, Cl. D9-398.000.

Cowley, Harold E.: *See—*
Fishel, Gerald C.; Cowley, Harold E.; and Myers, Dean W., 269,814, Cl. D24-38.000.

Cramer, Jerry W., to Sunkist Growers, Inc. Bag filling device. 269,787, 7-19-83, Cl. D15-145.000.

Cycles Peugeot: *See—*
Geney, Gilbert, 269,760, Cl. D8-382.000.

Dahl-Braden, Chapman Architects, Inc.: *See—*
Barthel, John E., 269,822, Cl. D99-28.000.

Danish Stove Association, ApS: *See—*
Sorensen, Winston J. F., 269,804, Cl. D23-97.000.

DiTullio, Flavia, to Consolidated Foods Corporation. Brassiere. 269,730, 7-19-83, Cl. D2-24.000.

Doodson, Peter J., to U.S. Philips Corporation. Intercom speaker and receiver. 269,780, 7-19-83, Cl. D14-57.000.

Draheim, Harvey J.: *See—*
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 269,742, Cl. D6-16.000.
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 269,757, Cl. D6-198.000.

Dri Steem Humidifier Company: *See—*
Morton, Bernard W., 269,808, Cl. D23-146.000.

Dudrey, Carl: *See—*
Stringfellow, Michael J., 269,796, Cl. D22-20.000.

Eaton Corporation: *See—*
Heater, Richard W., 269,783, Cl. D15-5.000.

Famolare, Inc.: *See—*
Famolare, Joseph P., Jr., 269,732, Cl. D2-319.000.

Famolare, Joseph P., Jr., to Famolare, Inc. Shoe bottom. 269,732, 7-19-83, Cl. D2-319.000.

Farr, Evelyn: *See—*
Meier, Robert H.; and Farr, Evelyn, 269,816, Cl. D24-64.000.

Fee, Robert W.; Robbins, Richard J.; and Neufeld, Henry L., to Brunswick Corporation. Fishing reel. 269,798, 7-19-83, Cl. D22-25.000.

Fehlbaum & Co.: *See—*
Muller-Deisig, Wolfgang, 269,743, Cl. D6-31.000.

First International Services Corporation: *See—*
Barthel, John E., 269,823, Cl. D99-28.000.

Fishel, Gerald C.; Cowley, Harold E.; and Myers, Dean W., to Gerico Fiberglass Products, Inc. Spa. 269,814, 7-19-83, Cl. D24-38.000.

Foggia, Donald A.; Muzumdar, Deepak R.; Klaiber, Gerhart F.; and Schneider, Rolf E., to Siemens Corporation. Telephone busy lamp field console with display. 269,781, 7-19-83, Cl. D14-58.000.

Fortuna, Vincent E., to Cosden Technology, Inc. Packaging container. 269,763, 7-19-83, Cl. D9-398.000.

Fortuna, Vincent E., to Cosden Technology, Inc. Packaging container. 269,764, 7-19-83, Cl. D9-398.000.

Fortuna, Vincent E., to Cosden Technology, Inc. Packaging container. 269,765, 7-19-83, Cl. D9-398.000.

Foster, Daniel F. CRT Terminal stand. 269,749, 7-19-83, Cl. D6-85.000.

Frazier, James F., to Whelen Engineering Company, Inc. Aircraft tail position light. 269,817, 7-19-83, Cl. D26-35.000.

Froidevaux, Jean-Marie, to Aliseo Diffusion S.A. Wall mounted hair drying device. 269,819, 7-19-83, Cl. D28-12.000.

Gaunt, Thomas N., to Plastona (John Waddington) Limited. Can or the like. 269,761, 7-19-83, Cl. D9-370.000.

General Mills Products Corp.: *See—*
Meyer, Muriel, 269,769, Cl. D11-82.000.
Strasser, Andrew G.; Tierney, Donna M.; and Thorsen, Daniel B., 269,766, Cl. D9-457.000.

Geney, Gilbert, to Cycles Peugeot. Securing device for a generator fixed by a slideway on seat-stays of a bicycle. 269,760, 7-19-83, Cl. D8-382.000.

Gerico Fiberglass Products, Inc.: *See—*
Fishel, Gerald C.; Cowley, Harold E.; and Myers, Dean W., 269,814, Cl. D24-38.000.

Giveans, David L., to SB/JP Enterprises, Inc. Playhouse. 269,793, 7-19-83, Cl. D21-114.000.

Grant, Andrew, to BP Oil Limited. Bottle. 269,762, 7-19-83, Cl. D9-375.000.

Green, Joseph C.: *See—*
Alexander, Roy P.; Sangster, Arlon G.; and Green, Joseph C., 269,802, Cl. D23-03.000.

Hahn, Daniel G., to AMF Incorporated. Combined front and rear fenders, chain guard, engine cover and fuel tank for moped. 269,772, 7-19-83, Cl. D12-110.000.

Heater, Richard W., to Eaton Corporation. Housing of a viscous fan drive. 269,783, 7-19-83, Cl. D15-5.000.

Hoese, Fred O. Motorcycle radio cover. 269,775, 7-19-83, Cl. D12-192.000.

Houlihan, John T.; and Maliskas, John S., to Timex Corporation. Digital watch. 269,767, 7-19-83, Cl. D10-38.000.

Hurley, Merle. Combined cat playground and exerciser. 269,821, 7-19-83, Cl. D30-42.000.

Jaro, Inc.: *See—*
Braswell, Charles A., 269,758, Cl. D7-337.000.

Jones, Paul W.: *See—*
Mace, Leslie E.; Jones, Paul W.; and Boonstra, Robert M., 269,810, Cl. D24-17.000.

Jordan, James B.: *See—*
Canning, Daniel; and Jordan, James B., 269,782, Cl. D14-111.000.

Kates, Fred W., to Revlon, Inc. Display unit. 269,754, 7-19-83, Cl. D6-186.000.

Kaufman, Jack W. Swabbing stick. 269,811, 7-19-83, Cl. D24-34.000.

Klaiber, Gerhart F.: *See—*
Foggia, Donald A.; Muzumdar, Deepak R.; Klaiber, Gerhart F.; and Schneider, Rolf E., 269,781, Cl. D14-58.000.

Lancellotti, William E. Chiropractic activator. 269,812, 7-19-83, Cl. D24-36.000.

LeBlue, Wallace J. Guitar. 269,788, 7-19-83, Cl. D17-14.000.

Lents, Charles M., to Stainless IceTainer Company. Sanitary countertop machine for storing and dispensing particulate ice. 269,785, 7-19-83, Cl. D15-80.000.

Long, Stapleton, to Berkline Corporation, The. Settee. 269,745, 7-19-83, Cl. D6-63.000.

Lyon-Shaw, Inc.: *See—*
Wallace, Frederick J., 269,744, Cl. D6-56.000.
Wallace, Frederick J., 269,747, Cl. D6-70.000.

M/M Verdi International, Inc.: *See—*
Stark, Ted, 269,736, Cl. D3-71.000.
Stark, Ted, 269,737, Cl. D3-71.000.
Stark, Ted, 269,738, Cl. D3-77.000.
Stark, Ted, 269,739, Cl. D3-71.000.
Stark, Ted, 269,740, Cl. D3-71.000.
Stark, Ted, 269,741, Cl. D3-71.000.

Mace, Leslie E.; Jones, Paul W.; and Boonstra, Robert M., to Physio-Control Corporation. Physiological signals monitor/recorder or the like. 269,810, 7-19-83, Cl. D24-17.000.

Maliskas, John S.: *See—*
Houlihan, John T.; and Maliskas, John S., 269,767, Cl. D10-38.000.

Mattiuzzo, Mario, to Nordica S.P.A. After ski boot. 269,731, 7-19-83, Cl. D2-275.000.

McGregor, Donald G. Polarized terminal blade. 269,778, 7-19-83, Cl. D13-24.000.

Meier, Robert H.; and Farr, Evelyn, to Camp International, Inc. Shin splint. 269,816, 7-19-83, Cl. D24-64.000.

Meyer, Muriel, to General Mills Products Corp. Segmented turtle-shaped pendant or similar article. 269,769, 7-19-83, Cl. D11-82.000.

Miracle Recreation Equipment Company: *See—*
Ament, Donald S., 269,818, Cl. D26-73.000.

Monson, Todd D. Housing for simulating heartbeat and womb sounds. 269,789, 7-19-83, Cl. D19-59.000.

Morgan, Donald F. Wheel center. 269,776, 7-19-83, Cl. D12-204.000.

Morrow, Robert B.: *See—*
Morrow, William E.; and Morrow, Robert B., 269,807, Cl. D23-139.000.

Morrow, William E.; and Morrow, Robert B., to Aqua-Mist, Inc. Air pre-cooler unit for air conditioners or the like. 269,807, 7-19-83, Cl. D23-139.000.

Morton, Bernard W., to Dri Steem Humidifier Company. Humidifier dispersion tube. 269,808, 7-19-83, Cl. D23-146.000.

Muller-Deisig, Wolfgang, to Fehlbaum & Co. Chair. 269,743, 7-19-83, Cl. D6-31.000.

Muzumdar, Deepak R.: *See—*
Foggia, Donald A.; Muzumdar, Deepak R.; Klaiber, Gerhart F.; and Schneider, Rolf E., 269,781, Cl. D14-58.000.

Myers, Dean W.: *See*—
Fishel, Gerald C.; Cowley, Harold E.; and Myers, Dean W., 269,814, Cl. D24-38.000.
Neufeld, Henry L.: *See*—
Fee, Robert W.; Robbins, Richard J.; and Neufeld, Henry L., 269,798, Cl. D22-25.000.
Niconchuk, Alec W., to North Shore Laboratories Corp. Compression tool for inside tire repair or similar article. 269,773, 7-19-83, Cl. D12-153.000.
Nordica S.P.A.: *See*—
Mattiuzzo, Mario, 269,731, Cl. D2-275.000.
Nordson Corporation: *See*—
Sandham, Edwin C., 269,756, Cl. D6-194.000.
North Shore Laboratories Corp.: *See*—
Niconchuk, Alec W., 269,773, Cl. D12-153.000.
Offredi, Giovanni. Collapsible table. 269,753, 7-19-83, Cl. D6-178.000.
Okada, Hidekazu, to Clover Mfg. Co., Ltd. Knitting needle. 269,734, 7-19-83, Cl. D3-28.000.
Olin Corporation: *See*—
Alexander, Roy P.; Sangster, Arlon G.; and Green, Joseph C., 269,802, Cl. D23-03.000.
Sangster, Arlon G.; and Tepas, Joseph J., Jr., 269,801, Cl. D23-03.000.
Ostling, Sture, to AB SKF. Bearing housing. 269,786, 7-19-83, Cl. D15-143.000.
Phillips Plastics Corp.: *See*—
Wollar, Burnell J., 269,759, Cl. D8-388.000.
Physio-Control Corporation: *See*—
Mace, Leslie E.; Jones, Paul W.; and Boonstra, Robert M., 269,810, Cl. D24-17.000.
Pittenger, James E.; and Worth, William S. Jewelry chain clasp. 269,770, 7-19-83, Cl. D11-87.000.
Plastona (John Waddington) Limited: *See*—
Gaunt, Thomas N., 269,761, Cl. D9-370.000.
Qually, Robert L. Pacifier. 269,815, 7-19-83, Cl. D24-45.000.
Qume Corporation: *See*—
Canning, Daniel; and Jordan, James B., 269,782, Cl. D14-111.000.
Revlon, Inc.: *See*—
Kates, Fred W., 269,754, Cl. D6-186.000.
Rieman, Paul F. Caddy for assembled rods and reels. 269,751, 7-19-83, Cl. D6-125.000.
Riis, Douglas D. Ice fishing rod. 269,797, 7-19-83, Cl. D22-23.000.
Robbins, Richard J.: *See*—
Fee, Robert W.; Robbins, Richard J.; and Neufeld, Henry L., 269,798, Cl. D22-25.000.
Roper Corporation: *See*—
Stark, Philip D., 269,784, Cl. D15-12.000.
Ross, James E.: *See*—
Bevilacqua, John E., Jr.; and Ross, James E., 269,779, Cl. D14-53.000.
Salon Nicole Bisson Inc.: *See*—
Bisson, Nicole, 269,820, Cl. D28-25.000.
Sandham, Edwin C., to Nordson Corporation. Support bracket for a table leg. 269,756, 7-19-83, Cl. D6-194.000.
Sangster, Arlon G.; and Tepas, Joseph J., Jr., to Olin Corporation. Swimming pool chemical dispenser or the like. 269,801, 7-19-83, Cl. D23-03.000.
Sangster, Arlon G.: *See*—
Alexander, Roy P.; Sangster, Arlon G.; and Green, Joseph C., 269,802, Cl. D23-03.000.
SB/JP Enterprises, Inc.: *See*—
Giveans, David L., 269,793, Cl. D21-114.000.
Schaffer, Michael J.: *See*—
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 269,742, Cl. D6-16.000.
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 269,757, Cl. D6-198.000.
Schawarzli, Joseph W. Support bracket for automotive roof rack. 269,774, 7-19-83, Cl. D12-157.000.
Schneider, Rolf E.: *See*—
Foggia, Donald A.; Muzumdar, Deepak R.; Klaiber, Gerhart F.; and Schneider, Rolf E., 269,781, Cl. D14-58.000.
Siemens Corporation: *See*—
Foggia, Donald A.; Muzumdar, Deepak R.; Klaiber, Gerhart F.; and Schneider, Rolf E., 269,781, Cl. D14-58.000.
Simmons Universal Corporation: *See*—
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 269,742, Cl. D6-16.000.
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 269,757, Cl. D6-198.000.
Sorensen, Winston J. F., to Danish Stove Association, ApS. Stove. 269,804, 7-19-83, Cl. D23-97.000.
Stainless IceTainer Company: *See*—
Lents, Charles M., 269,785, Cl. D15-80.000.
Stair, Eugene V. Fuel loader for loading fuel such as wood logs into wood burning stoves. 269,805, 7-19-83, Cl. D23-125.000.
Stark, Philip D., to Roper Corporation. Agricultural tiller. 269,784, 7-19-83, Cl. D15-12.000.
Stark, Ted, to M/M Verdi International, Inc. Luggage. 269,736, 7-19-83, Cl. D3-71.000.
Stark, Ted, to M/M Verdi International, Inc. Luggage. 269,737, 7-19-83, Cl. D3-71.000.
Stark, Ted, to M/M Verdi International, Inc. Luggage. 269,738, 7-19-83, Cl. D3-77.000.
Stark, Ted, to M/M Verdi International, Inc. Luggage. 269,739, 7-19-83, Cl. D3-71.000.
Stark, Ted, to M/M Verdi International, Inc. Luggage. 269,740, 7-19-83, Cl. D3-71.000.
Stark, Ted, to M/M Verdi International, Inc. Luggage. 269,741, 7-19-83, Cl. D3-71.000.
Strasser, Andrew G.; Tierney, Donna M.; and Thorsen, Daniel B., to General Mills Products Corp. Display card for jewelry articles or the like. 269,766, 7-19-83, Cl. D9-457.000.
Stringfellow, Michael J., to Dudrey, Carl. Insect catching device or the like. 269,796, 7-19-83, Cl. D22-20.000.
Sunkist Growers, Inc.: *See*—
Cramer, Jerry W., 269,787, Cl. D15-145.000.
Syme, Duncan C., to Vermont Castings, Inc. Warming shelf for a parlor stove. 269,806, 7-19-83, Cl. D23-127.000.
Tepas, Joseph J., Jr.: *See*—
Sangster, Arlon G.; and Tepas, Joseph J., Jr., 269,801, Cl. D23-03.000.
Terenzoni, Amerigo. Front and side panels of a desk. 269,755, 7-19-83, Cl. D6-192.000.
Terry, Peter A. Symbolic pin. 269,768, 7-19-83, Cl. D11-47.000.
Thorsen, Daniel B.: *See*—
Strasser, Andrew G.; Tierney, Donna M.; and Thorsen, Daniel B., 269,756, Cl. D9-457.000.
Tierney, Donna M.: *See*—
Strasser, Andrew G.; Tierney, Donna M.; and Thorsen, Daniel B., 269,766, Cl. D9-457.000.
Timex Corporation: *See*—
Houlihan, John T.; and Maliskas, John S., 269,767, Cl. D10-38.000.
Topete, Lino Z. Combined hydrotherapy spa and swimming pool. 269,813, 7-19-83, Cl. D24-38.000.
United Artists Corporation: *See*—
Bevilacqua, John E., Jr; and Ross, James E., 269,779, Cl. D14-53.000.
U.S. Philips Corporation: *See*—
Doodson, Peter J., 269,780, Cl. D14-57.000.
Vermont Castings, Inc.: *See*—
Syme, Duncan C., 269,806, Cl. D23-127.000.
Wallace, Frederick J., to Lyon-Shaw, Inc. Chair. 269,744, 7-19-83, Cl. D6-56.000.
Wallace, Frederick J., to Lyon-Shaw Incorporated. Seat. 269,747, 7-19-83, Cl. D6-70.000.
Waller, Johnny J. Fishing lure. 269,799, 7-19-83, Cl. D22-27.000.
Waller, Johnny J. Fishing lure. 269,800, 7-19-83, Cl. D22-27.000.
Whelen Engineering Company, Inc.: *See*—
Frazier, James F., 269,817, Cl. D26-35.000.
Williams, Cole. Simulated Christmas tree. 269,771, 7-19-83, Cl. D11-118.000.
Williams, Robert L., to Bendix Corporation, The. Diaphragm plate for a servomotor. 269,777, 7-19-83, Cl. D13-1.000.
Wollar, Burnell J., to Phillips Plastics Corp. Drive fastener shank. 269,759, 7-19-83, Cl. D8-388.000.
Worth, William S.: *See*—
Pittenger, James E.; and Worth, William S., 269,770, Cl. D11-87.000.
Zonnenberg, Martin B. P. Molded meat product or similar article. 269,729, 7-19-83, Cl. D1-26.000.

LIST OF PLANT PATENTEES

Bennett, Cecilia L. D. Miniature rose plant. 5,069, 7-19-83, Cl. 9.000.
Bennett, Cecilia L. D. Miniature rose plant. 5,070, 7-19-83, Cl. 9.000.
Blaser, John A.; and Boyette, Robert J. Callistemon 'Boyette'. 5,072, 7-19-83, Cl. 54.000.
Boyette, Robert J.: *See*—
Blaser, John A.; and Boyette, Robert J., 5,072, Cl. 54.000.
Driscoll Strawberry Associates, Inc.: *See*—
Johnson, Harold A., Jr., 5,071, Cl. 48.000.
Johnson, Harold A., Jr., to Driscoll Strawberry Associates, Inc. Strawberry plant. 5,071, 7-19-83, Cl. 48.000.

CLASSIFICATION OF PATENTS

ISSUED JULY 19, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

12 4,393,519
16 4,393,520
56 4,393,521
336 4,393,522

CLASS 4

192 4,393,523
317 4,393,524
420.2 4,393,525
490 4,393,526
493 4,393,527
498 4,393,528

CLASS 5

81 R 4,393,529
437 4,393,530
451 4,393,531

CLASS 8

103 4,394,125
115.6 4,394,126
137 4,394,127
138 4,394,128
149.1 4,393,532
543 4,394,129
661 4,394,130

CLASS 14

2.6 4,393,533

CLASS 15

98 4,393,534
169 4,393,535
320 4,393,538
327 C 4,393,536
348 4,393,537

CLASS 16

114 R 4,393,539
4,393,540
297 4,393,541
369 4,393,542

CLASS 17

72 4,393,543
73 4,393,544
76 4,393,545
4,393,546

CLASS 19

105 4,393,547

CLASS 24

16 PB 4,393,548
115 A 4,393,549
117 4,393,550
213 C 4,393,552
213 R 4,393,551
230 A 4,393,555
4,393,557
230 AL 4,393,553
4,393,554
230 R 4,393,556
4,393,558
277 4,393,559
295 4,393,560
297 4,393,561

CLASS 26

2 R 4,393,562

CLASS 29

149.5 DP 4,393,563
157.3 C 4,393,564
157.3 R 4,393,565
417 4,393,566
421 R 4,393,567
432 4,393,568
460 4,393,569
560 4,393,570
564.6 4,393,571
571 4,393,572
4,393,573
4,393,574
4,393,575
572 4,393,576
576 B 4,393,577
4,393,578
740 4,393,579
749 4,393,580
827 4,393,581
828 4,393,582
857 4,393,583
877 4,393,584

CLASS 30

34.1 4,393,585
43.6 4,393,586
162 4,393,587
196 4,393,588
381 4,393,589
387 4,393,590

CLASS 33

1 L 4,393,591
172 B 4,393,592
184.5 4,393,593
203.16 4,393,594
245 4,393,595
264 4,393,596
275 G 4,393,597
302 4,393,598
336 4,393,599
474 4,393,600
494 4,393,601

CLASS 34

34 4,393,602
39 4,393,603

CLASS 36

67 R 4,393,604
114 4,393,605

CLASS 37

103 4,393,606
4,393,607
124 4,393,608
238 4,393,609

CLASS 40

107 4,393,611
152 4,393,612
625 4,393,610

CLASS 42

90 4,393,613
94 4,393,614

CLASS 43

15 4,393,615
60 4,393,616
96 4,393,617

CLASS 44

51 4,394,131
4,394,132
56 4,394,133
62 4,394,134
71 4,394,135

CLASS 46

35 4,393,618
165 4,393,619
201 4,393,620

CLASS 47

40.5 4,393,621
48.5 4,393,622

CLASS 48

111 4,394,136
197 R 4,394,137

CLASS 49

248 4,393,623

CLASS 51

5 D 4,393,624
165.87 4,393,625
168 4,393,626
246 4,393,627
281 SF 4,393,628

CLASS 52

74 4,393,629
121 4,393,630
144 4,393,631
235 4,393,632
303 4,393,633
309.1 4,393,634
309.11 4,393,635
381 4,393,636
644 4,393,637
704 4,393,638
730 4,393,639

CLASS 53

69 4,393,640
138 A 4,393,641
266 R 4,393,642
471 4,393,643

CLASS 55

1 4,394,138
20 4,394,139
184 4,394,140
195 4,394,141
242 4,394,142
261 4,394,143
281 4,394,144
347 4,394,145
354 4,394,146
357 4,394,147

CLASS 56

12.8 4,393,644
202 4,393,645

CLASS 57

22 4,393,646
81 4,393,647
413 4,393,648

CLASS 60

39.05 4,393,649
39.093 4,393,650
39.281 4,393,651
295 4,393,652
511 4,393,653
527 4,393,654
585 4,393,655
618 4,393,656
653 4,393,657
657 4,393,658

CLASS 62

66 4,393,659
69 4,393,660
113 4,393,661
115 4,393,662
119 4,393,663
256 4,393,664
457 4,393,665
506 4,393,666

CLASS 63

29 R 4,393,667

CLASS 64

4.32 4,394,287

CLASS 65

159 4,394,148

CLASS 66

4 4,393,668
13 4,393,669
75.2 4,393,670

CLASS 68

5 C 4,393,671

CLASS 70

277 4,393,672
358 4,393,673

CLASS 71

28 4,394,149
62 4,394,150
76 4,394,151
77 4,394,152
92 4,394,153
4,394,154
94 4,394,155
4,394,156
4,394,157
4,394,158
98 4,394,159

CLASS 72

61 4,393,674
71 4,393,675
92 4,393,676
97 4,393,677
131 4,393,678
221 4,393,679
234 4,393,680
329 4,393,681
405 4,393,682
422 4,393,683
451 4,393,684
481 4,393,685

CLASS 73

23 4,393,686
35 4,393,687
4,393,688
4,393,689
64.2 4,393,690
66 4,393,691
84 4,393,692
115 4,393,693
116 4,393,694
117 4,393,695
117.3 4,393,696
4,393,697
118 4,393,698
4,393,699
150 A 4,393,700
160 4,393,701
204 4,393,702
432 R 4,393,703
4,393,704
439 4,393,705
505 4,393,706
4,393,707
4,393,708
4,393,709
517 B 4,393,710
592 4,393,711
603 4,393,712
701 4,393,713
718 4,393,714
728 4,393,715
818 4,393,716
821 4,393,717
859 4,393,718
861.05 4,393,719
4,393,720
861.21 4,393,721
861.61 4,393,722
861.72 4,393,723
861.91 4,393,724
862.41 4,393,725
862.48 Re.31,312
864.84 4,393,726

CLASS 74

209 4,393,727
469 4,393,728
475 4,393,729
538 4,393,730
689 4,393,731
866 4,393,732

CLASS 75

0.5 AA 4,394,160
0.5 BC 4,394,161
10 R 4,394,162
11 4,394,163
21 4,394,164
60 4,394,165
65 R 4,394,166
68 A 4,394,167
126 A 4,394,168
128 A 4,394,169
233 4,394,170

CLASS 81

3.38 A 4,393,733
468 4,393,734

CLASS 82

36 R 4,393,735

CLASS 83

100 4,393,736
356.3 4,393,737
663 4,393,738
834 4,393,739

CLASS 84

1.01 4,393,740
4,393,741
1.23 4,393,742
4,393,743

CLASS 86

25 4,393,744

CLASS 89

1.806 4,393,745
34 4,393,746
45 4,393,747
47 4,393,748

CLASS 91

376 R 4,393,749
4,393,750
408 4,393,751

CLASS 92

86 4,393,752

CLASS 98

2.12 4,393,753
2.14 4,393,754

CLASS 99

348 4,393,755
4,393,756
369 4,393,757
450.6 4,393,758
459 4,393,759
510 4,393,760
589 4,393,761
609 4,393,762

CLASS 100

2 4,393,763
88 4,393,764
98 R 4,393,765
99 4,393,766
229 A 4,393,767

CLASS 101

45 4,393,768
93.22 4,393,770
93.3 4,393,769
93.48 4,393,771
217 4,393,772
232 4,393,773
288 4,393,774
365 4,393,775
4,393,776
407 BP 4,393,777
425 4,393,778

CLASS 102

202.5 4,393,779
255 4,393,780
440 4,393,781
446 4,393,782
529 4,393,783

CLASS 104

2 4,393,784
69 4,394,173
110 4,393,785
141 4,393,786

CLASS 105

282 B1 3,707,126
199 CB 4,393,787

CLASS 106

1.14 4,394,171
38.5 D 4,394,172
85 4,394,174
90 4,394,175
120 4,394,176
287.14 4,394,177

CLASS 109

2 4,393,788
19 4,393,789
76 4,393,790

CLASS 111

34 4,393,791

CLASS 112

3 R 4,393,792
79 R 4,393,793
158 B 4,393,797
158 E 4,393,794
4,393,795
4,393,796
231 4,393,798
262.1 4,393,799
265.1 4,393,800
282 4,393,801

CLASS 114

67 A 4,393,802
201 R 4,393,888
254 4,393,803

CLASS 118

60 4,393,804
105 4,393,805
412 4,393,806
501 4,393,807
503 4,393,808
620 4,393,809
657 4,393,810

CLASS 119

14.47 4,393,811
16 4,393,812
72.5 4,393,813

CLASS 122

22 4,393,814
31 R 4,393,815
412 4,393,816

CLASS 123

3 4,393,817
23 4,393,818
41.08 4,393,819
90.41 4,393,820
195 C 4,393,821
195 R 4,393,822
196 AB 4,393,824
196 M 4,393,823
198 DB 4,393,826
198 F 4,393,825
4,393,827
203 4,393,828
249 4,393,829
272 4,393,830
323 4,393,831
327 4,393,832
335 4,393,833
339 4,393,834
357 4,393,835
417 4,393,836
425 4,393,837
435 4,393,838
440 4,393,839
4,393,840
4,393,841
4,393,842
4,393,843
450 4,393,844
478 4,393,845
502 4,393,846
4,393,847
525 4,393,848
536 4,393,849
4,393,850
557 4,393,851
564 4,393,852
568 4,393,853
576 4,393,854
587 4,393,855

CLASS 125

3 4,393,856

CLASS 126

9 R 4,393,857
351 4,393,858
429 4,393,859
4,393,860
436 4,393,861
448 4,393,862

CLASS 127

46.3 4,394,178

CLASS 128

303 B1 4,073,296
1 R 4,393,863
1.1 4,393,864
80 A 4,393,865
87 R 4,393,866
4,393,867
92 A 4,393,868
204.18 4,393,869
419 PT 4,393,874
425 4,393,875
583 4,393,876
705 4,393,877
748 4,393,878
758 4,393,879
760 4,393,880
4,393,881
764 4,393,882
785 4,393,883

CLASS 131

273 4,393,884
339 4,393,885

CLASS 132

7 4,393,886

CLASS 134

4,394,179

CLASS 135

109 4,393,887

CLASS 136

245 4,394,529

CLASS 137

72 4,393,889
78.2 4,393,890
238 4,393,891
242 4,393,892
246.12 4,393,893
454 4,393,894
539.5 4,393,895
601 4,393,896
831 4,393,897
4,393,898

CLASS 138

89 4,393,899
4,393,900
145 4,393,901

CLASS 139

76 4,393,902
370.2 4,393,903

CLASS 140

92.1 4,393,904
118 4,393,905

CLASS 141

387 4,393,906

CLASS 145

29 A 4,393,908

CLASS 148

1.5 4,394,180
4,394,181
4,394,182
4,394,183
6.15 R 4,394,184
11.5 C 4,394,185
12 EA 4,394,188
12 F 4,394,186
4,394,187
12 R 4,394,189
31.55 4,394,190
33.1 4,394,191
103 Re.31,317
120 4,394,192
129 4,394,193
131 4,394,194
149 4,394,195
187 4,394,196

CLASS 149

19.3 4,394,197
21 4,394,198
4,394,199

CLASS 150

8 4,393,909
12 4,393,910

CLASS 152

158 4,393,911
353 R 4,393,912
364 4,393,913

CLASS 156

72 4,394,200
73.6 4,394,201
94 4,394,202
175 4,394,203
275.1 4,394,204
307.3 4,394,205
322 4,394,206
578 4,394,207
580.1 4,394,208
4,394,209
608 4,394,210
628 4,394,211

CLASS 157

1.2 4,393,914

CLASS 160

395 4,393,915

CLASS 162

162 4,394,212
163 4,394,213
228 4,394,214

CLASS 164

119 4,393,916
476 4,393,917

CLASS 165

10 4,393,918
11 A 4,393,920
11 R 4,393,919
40 4,393,921
41 4,393,922
46 4,393,923
104.12 4,393,924
122 4,393,925
165 4,393,926

CLASS 166

105 4,393,927
4,393,928
134 4,393,929
188 4,393,930
208 4,393,931
249 4,393,932
250 Re.31,313
4,393,933
261 4,393,934
263 4,393,935
4,393,936
272 4,393,937
279 4,393,938
293 4,393,939
325 4,393,940

CLASS 169

70 4,393,941

CLASS 172

2 4,393,942
260.5 4,393,943

CLASS 173

28 4,393,944
163 4,393,945

CLASS 174

15 S 4,394,534
16 HS 4,394,530
24 4,394,531
72 B 4,394,532
74 R 4,394,533

CLASS 175

4.56 4,393,946
323 4,393,947
374 4,393,948
377 4,393,949

CLASS 177

108 4,393,950
136 4,393,951

CLASS 179

1 G 4,394,536
4,394,537
1 GP 4,394,535
1 SD 4,394,538
2 AM 4,394,540
2 TC 4,394,539
18 GE 4,394,541
81 B 4,394,542
84 R 4,394,543
99 H 4,394,544
179 4,394,545

CLASS 180

6.44 4,393,952
190 4,393,953
205 4,393,954
291 4,393,955

CLASS 181

265 4,393,956

CLASS 184

3 R 4,393,957
7 D 4,393,958

CLASS 187

9 E 4,393,959

CLASS 188

62 4,393,960
67 4,393,961
72.6 4,393,962
73.45 4,393,963

CLASS 192

48.91 4,393,965
56 R 4,393,966
84 E 4,393,967
98 4,393,968
99 S 4,393,907
044 4,393,964

CLASS 193

35 TE 4,393,969

CLASS 194

17 4,393,970
93 4,393,971
99 4,393,972

CLASS 196

14.52 4,394,215

CLASS 198

384 4,393,973

CLASS 200

5 A 4,394,547
5 R 4,394,546
6 A 4,394,548
16 E 4,394,549
34 4,394,550
44 4,394,551
61.62 4,394,552
67 DA 4,394,553
144 B 4,394,554
159 R 4,394,555
161 4,394,556

CLASS 202

170 4,394,216
227 4,394,217
263 4,394,218

CLASS 203

1 4,394,219
42 4,394,220
89 4,394,221

CLASS 204

1 T 4,394,222
15 4,394,223
57 4,394,224
59 R 4,394,225
72 4,394,226
73 R 4,394,227
98 4,394,228
4,394,229
129 4,394,230
4,394,231
144 4,394,232
158 HA 4,394,233
164 4,394,234
165 4,394,235
192 E 4,394,237
192 R 4,394,236
198 4,394,241
243 R 4,394,242
284 4,394,243
295 4,394,244
298 4,394,245
301 4,394,246
400 4,394,238
412 4,394,240
414 4,394,239

CLASS 206

37 4,393,974
385 4,393,975

CLASS 208

10 4,394,247
4,394,248
4,394,249
89 4,394,249
108 4,394,250
111 4,394,251
134 4,394,252
251 H 4,394,253
310 Z 4,394,254

CLASS 209

135 4,394,256
166 4,394,257
170 4,394,258
250 4,394,259
500 4,394,260

CLASS 210

96.1 4,394,261
103 4,394,262
198.2 4,394,263
222 4,394,264
242.3 4,394,265
244 4,394,266
331 4,394,267
628 4,394,268
690 4,394,269
726 4,394,270
773 4,394,271
779 4,394,272

CLASS 215

211 4,393,976
4,393,977
253 4,393,978

CLASS 219

10.55 B 4,394,557
60 W 4,394,558
125.12 4,394,559
137 WM 4,394,560
285 4,394,561
306 4,394,562
342 4,394,563
449 4,394,564
452 4,394,565
523 4,394,566

CLASS 220

85 S 4,393,980
270 4,393,979

CLASS 221

289 4,393,981

CLASS 222

209 4,393,982
233 4,393,983
402.18 4,393,984
591 4,393,985

CLASS 224

32 A 4,393,986

CLASS 228

157 4,393,987

CLASS 229

43 4,393,988
71 4,393,989

CLASS 235

375 4,394,567
475 4,394,568

CLASS 239

1 4,393,990
102 4,393,991
200 4,393,992
332 4,393,993
585 4,393,994

CLASS 242

107.4 A 4,393,995

CLASS 244

110 C 4,393,996
135 R 4,393,997

CLASS 248

74 R 4,393,998
346 4,393,999
466 4,394,000
542 4,394,001

CLASS 250

204 4,394,569
209 4,394,570
216 4,394,571
239 4,394,572
253 4,394,573
262 4,394,574
343 4,394,575
366 4,394,576
372 4,394,577
374 4,394,578
423 P 4,394,579
461.1 4,394,580
484.1 4,394,581

CLASS 251

144 4,394,002
173 4,394,003

CLASS 252

8.55 R 4,394,273
12 4,394,275
32.7 E 4,394,276
4,394,277
46.3 4,394,278
46.4 4,394,279
62.2 4,394,280
62.55 4,394,281
4,394,282
70 4,394,283
153 4,394,284
174.11 4,394,285
182 4,394,286
350 4,394,288
359 E 4,394,289
412 4,394,290
429 B 4,394,291
4,394,292
430 4,394,293
4,394,294
431 C 4,394,295
433 4,394,296
437 4,394,297
438 4,394,298
447 4,394,299
455 Z 4,394,300
4,394,301
465 4,394,302
470 4,394,303
520 4,394,304
528 4,394,305
609 4,394,306

CLASS 254

204 4,394,004

CLASS 256

64 4,394,005

CLASS 260

112.5 R 4,394,308
140 4,394,309
162 4,394,310
239 BB 4,394,311
239.3 P 4,394,312
245.4 4,394,313
391 4,394,314
396 R 4,394,315
429 K 4,394,316
429 R 4,394,317
4,394,318
4,394,319
429.7 4,394,320
439 R 4,394,321
440 4,394,322
446 4,394,323
4,394,324
4,394,325
448 AD 4,394,326
455 R 4,394,327
463 4,394,328
467 4,394,329
932 4,394,330

CLASS 261

18 B 4,394,331

CLASS 264

8 4,394,332
37 4,394,333
80 4,394,334
82 4,394,335
109 4,394,336
122 4,394,337
135 4,394,338
177 F 4,394,339
219 4,394,340
225 4,394,341
292 4,394,342
296 4,394,343

CLASS 266

239 4,394,006
249 4,394,007

CLASS 271

9 4,394,008
10 4,394,009
22 4,394,010
107 4,394,011

CLASS 272

119 4,394,012

CLASS 273

1.5 R 4,394,013
73 C 4,394,015
73 G 4,394,014
109 4,394,016
237 4,394,017
4,394,018
256 4,394,019

CLASS 277

1 4,394,020
34.3 4,394,021
36 4,394,022
84 Re.31,314
124 4,394,023
207 A 4,394,024
4,394,025
231 4,394,026

CLASS 280

5 C 4,394,027
11.19 4,394,028
11.23 4,394,029
434 4,394,030
515 4,394,031
618 4,394,032
736 4,394,033
801 4,394,034
804 4,394,035
4,394,036
816 4,394,037

CLASS 282

1 R 4,394,038

CLASS 285

85 4,394,039

CLASS 290

4 C 4,394,582

CLASS 294

66 R 4,394,040
163 4,394,042
181 R 4,394,041

CLASS 296

97 H 4,394,043
218 4,394,044

CLASS 297

118 4,394,045
132 4,394,046
361 4,394,047
367 4,394,048
439 4,394,049
468 4,394,050

CLASS 299

16 4,394,051
18 4,394,052
81 4,394,053

CLASS 307

108 4,394,583
117 4,394,584
140 4,394,585
355 4,394,587
443 4,394,588
450 4,394,589
584 4,394,590

CLASS 310

11 4,394,591
12 4,394,592
54 4,394,593
68 R 4,394,594
162 4,394,595
184 4,394,596
268 4,394,597

CLASS 312

7.2 4,394,054
196 4,394,055
216 4,394,056

CLASS 313

51 4,394,598
422 4,394,599
500 4,394,600
509 4,394,601

CLASS 315

71 4,394,602
311 4,394,603

CLASS 318

257 4,394,604
280 4,394,605
434 4,394,606
453 4,394,607
578 4,394,608
603 4,394,609
803 4,394,610

CLASS 320

21 4,394,611
31 4,394,612
48 4,394,613

CLASS 323

210 4,394,614

CLASS 324

51 4,394,615
52 4,394,616
57 Q 4,394,617
83 D 4,394,618
117 H 4,394,619
149 4,394,620
163 4,394,621

CLASS 330

4.3 4,394,623
151 4,394,624
267 4,394,625

CLASS 331

12 4,394,626
66 4,394,627

CLASS 332

19 4,394,628

CLASS 333

109 4,394,629
116 4,394,630
132 4,394,631
218 4,394,632
238 4,394,633

CLASS 335

216 4,394,634

CLASS 336

55 4,394,635
172 4,394,636
192 4,394,637

CLASS 337

264 4,394,638
292 4,394,639

CLASS 339

15 4,394,057
59 R 4,394,058
125 R 4,394,059

CLASS 340

23 4,394,640
347 DD 4,394,641
4,394,642
365 C 4,394,643
571 4,394,644
572 4,394,645
594 4,394,646

645 4,394,647
679 4,394,648
711 4,394,649
728 4,394,650
756 4,394,651
764 4,394,652
802 4,394,653
825.34 4,394,654
825.36 4,394,655
825.73 4,394,656
825.93 4,394,657

CLASS 343

7.7 4,394,658
16 M 4,394,659
100 SA 4,394,660

CLASS 346

1.1 4,394,661
33 R 4,394,662
75 4,394,663
76 R 4,394,664
4,394,665
82 4,394,666
137 4,394,667
139 R 4,394,668
140 R 4,394,669
4,394,670
155 4,394,671

CLASS 350

96.13 4,394,060
96.20 4,394,061
96.33 4,394,062
162.13 4,394,063
259 4,394,064
304 4,394,065
307 4,394,066
334 4,394,067
345 4,394,068
347 E 4,394,069
349 4,394,070
422 4,394,071
427 4,394,072
465 4,394,073

CLASS 351

206 4,394,074

CLASS 352

243 4,394,075

CLASS 354

5 4,394,076
25 4,394,077
31 4,394,078
33 4,394,079
173 4,394,080
234 4,394,081
246 4,394,082

CLASS 355

1 4,394,083
3 BE 4,394,084
3 R 4,394,085
4,394,086
14 E 4,394,087
14 R 4,394,088
88 4,394,089

CLASS 357

10 4,394,672
15 4,394,673
23 4,394,674
24 4,394,675
29 4,394,676
38 4,394,677
68 4,394,678
81 4,394,679

CLASS 358

22 4,394,680
60 4,394,681
73 4,394,682
107 4,394,683
111 4,394,684
134 4,394,686
147 4,394,687
160 4,394,688
168 4,394,689
180 4,394,690
194.1 4,394,691
229 4,394,692
264 4,394,685
298 4,394,693

CLASS 360

14.3 4,394,694
53 4,394,695
78 4,394,696
91 4,394,697
96.5 4,394,698
113 4,394,699
133 4,394,700
137 4,394,701

CLASS 361

315 B1 4,054,937
92 4,394,702
101 4,394,703
119 4,394,704
215 4,394,705
331 4,394,706
398 4,394,707
399 4,394,708
401 4,394,709
4,394,710
408 4,394,711
411 4,394,712
433 4,394,713

CLASS 362

32 4,394,714
153 4,394,715
158 4,394,716
247 4,394,717
278 4,394,718

CLASS 363

18 4,394,719
37 4,394,720
44 4,394,721
68 4,394,722
87 4,394,723
124 4,394,724

CLASS 364

200 Re.31,318
4,394,725
4,394,726
4,394,727
4,394,728
4,394,729
4,394,730
4,394,731
4,394,732
4,394,733
4,394,734
4,394,735
4,394,736
414 4,394,737
4,394,738
426 4,394,739
464 4,394,740
483 4,394,741
487 4,394,742
514 4,394,743
553 4,394,744
900 4,394,745

CLASS 365

36 4,394,746
104 4,394,747
4,394,748
106 4,394,749
218 4,394,750
227 4,394,751
4,394,752
236 4,394,753

CLASS 367

75 4,394,754

CLASS 368

121 4,394,090

CLASS 369

45 4,394,755

CLASS 370

56 4,394,756
80 Re.31,319
100 4,394,757
105 4,394,758
110.1 4,394,759
111 4,394,760

CLASS 371

8 4,394,761
38 4,394,762
4,394,763

CLASS 372

4,394,764

CLASS 373

52 4,394,765
120 4,394,766

CLASS 375

13 4,394,767
14 4,394,768

CLASS 376

146 4,394,344
245 4,394,345
258 4,394,346

CLASS 377

105 4,394,586
115 4,394,622
116 4,394,769

CLASS 378

169 4,394,770
172 4,394,771
182 4,394,772

CLASS 382

4 4,394,773
56 4,394,774

CLASS 384

101 4,394,091

CLASS 400

120 4,394,092
124 4,394,093
4,394,094

CLASS 403

49 4,394,095
360 4,394,097
408 4,394,096

CLASS 405

77 4,394,098

CLASS 409

104 4,394,099

CLASS 410

2 4,394,100
83 4,394,101

CLASS 414

5 4,394,102
24.5 4,394,103
276 4,394,104
436 4,394,105
622 4,394,106
631 4,394,107
680 4,394,108

CLASS 416

142 4,394,109

CLASS 417

63 Re.31,315
269 4,394,110
360 4,394,111

CLASS 418

61 B 4,394,112
98 4,394,113
269 4,394,114

CLASS 420

453 4,394,347
528 4,394,348

CLASS 422

147 4,394,349
150 4,394,350
171 4,394,351
232 4,394,352

CLASS 423

21.5 4,394,353
25 4,394,354
27 4,394,355
43 4,394,356
140 4,394,357
305 4,394,358
4,394,359
317 4,394,360
321 S 4,394,361
328 4,394,362
356 4,394,363
483 4,394,364
485 4,394,365
493 4,394,366
502 4,394,367
556 4,394,368
588 4,394,369

CLASS 424

15 4,394,370
52 4,394,371
85 4,394,372
95 4,394,373
4,394,374
114 4,394,375
150 4,394,376
177 4,394,377
184 4,394,378
211 4,394,379
246 4,394,384
269 4,394,380
274 4,394,381
283 4,394,382
285 4,394,383
4,394,385
298 4,394,386
300 4,394,387
304 4,394,388
308 4,394,389
330 4,394,390
366 4,394,391

CLASS 425

122 4,394,115
192 R 4,394,116
549 4,394,117

CLASS 426

101 4,394,392
231 4,394,393
285 4,394,394
4,394,395
332 4,394,396
481 4,394,398
557 4,394,397
658 4,394,399

CLASS 427

38 4,394,400
39 4,394,401
40 4,394,402
42 4,394,403
48 4,394,404
58 4,394,405
86 4,394,406
150 4,394,407
231 4,394,408

CLASS 428

36 4,394,409
43 4,394,410
70 4,394,411
174 4,394,412
257 4,394,413
288 4,394,414
332 4,394,415
341 4,394,416
383 4,394,417
391 4,394,418
416 4,394,419
447 4,394,420
547 4,394,421
592 4,394,422

CLASS 429

86 4,394,423

CLASS 430

6 4,394,424
65 4,394,425
4,394,426
68 4,394,427
83 4,394,428
102 4,394,429
110 4,394,430
119 4,394,431
120 4,394,432
151 4,394,433
270 4,394,434
287 4,394,435
311 4,394,436
312 4,394,437
321 4,394,438
336 4,394,439
379 4,394,440
524 4,394,441
532 4,394,442

CLASS 431

4 4,394,118
5 4,394,119
254 Re.31,316
284 4,394,120

CLASS 432

11 4,394,121
30 4,394,122
253 4,394,123

CLASS 435

6 4,394,443
11 4,394,444
19 4,394,445
88 4,394,446
104 4,394,447
172 4,394,448
188 4,394,449
191 4,394,450
253 4,394,451

CLASS 436

66 4,394,452

CLASS 441

86 4,394,124

CLASS 455

17 4,394,775
76 4,394,776
95 4,394,777
182 4,394,778
277 4,394,779
618 4,394,780

CLASS 501

66 4,394,453
112 4,394,454
117 4,394,455
138 4,394,456

CLASS 521

54 4,394,457
82 4,394,458
84 4,394,459
92 4,394,460
113 4,394,461
137 4,394,462
167 4,394,463
180 4,394,464

CLASS 523

116 4,394,465
141 4,394,466
205 4,394,467
4,394,468
212 4,394,469

CLASS 524

56 4,394,470
92 4,394,471
100 4,394,472
226 4,394,473
232 4,394,474
262 4,394,475
289 4,394,476
319 4,394,477
424 4,394,478
432 4,394,488
459 4,394,479
776 4,394,307

CLASS 525

43 4,394,480
54.5 4,394,481
4,394,482
60 4,394,483
72 4,394,484
74 4,394,485
162 4,394,486
281 4,394,487
370 4,394,489
438 4,394,490
452 4,394,491
504 4,394,492
530 4,394,493

CLASS 526

301 4,394,494

CLASS 528

67 4,394,495
98 4,394,496
101 4,394,497
193 4,394,498
229 4,394,499
313 4,394,500
485 4,394,501

CLASS 536

119 4,394,502

CLASS 544

25 4,394,503
28 4,394,504
91 4,394,505
321 4,394,506

CLASS 546

185 4,394,507
209 4,394,508
339 4,394,509

CLASS 548

240 4,394,510
343 4,394,511
365 4,394,512
374 4,394,513
508 4,394,514

CLASS 549

12 4,394,515
495 4,394,516

CLASS 556

419 4,394,517
424 4,394,518

CLASS 560

32 4,394,519

CLASS 562

557 4,394,520

CLASS 564

271 4,394,521
451 4,394,522
4,394,523
479 4,394,524

CLASS 568

462 4,394,525
716 4,394,526

CLASS 570

143 4,394,527

CLASS 585

14 4,394,528
667 4,394,255

CLASS 604

115 4,393,870
151 4,393,872
4,393,873

CLASS 609

58 4,393,871

CLASSIFICATION OF DESIGNS

D1—	26	269,729		63	269,745	D9—	370	269,761	D13—	1	269,777		114	269,793
D2—	24	269,730			269,746		375	269,762		24	269,778		210	269,794
	275	269,731		70	269,747		398	269,763	D14—	53	269,779			269,795
	319	269,732		76	269,748			269,764		57	269,780	D22—	20	269,796
D3—	7	269,733		85	269,749			269,765		58	269,781		23	269,797
	28	269,734			269,750		457	269,766		111	269,782		25	269,798
	39	269,735		125	269,751	D10—	38	269,767	D15—	5	269,783		27	269,799
	71	269,736		168	269,752	D11—	47	269,768		12	269,784			269,800
		269,737		178	269,753		82	269,769		80	269,785	D23—	03	269,801
		269,739		186	269,754		87	269,770		143	269,786			269,802
		269,740		192	269,755		118	269,771		145	269,787		95	269,803
		269,741		194	269,756	D12—	110	269,772	D17—	14	269,788		97	269,804
	77	269,738		198	269,757		153	269,773	D19—	59	269,789		125	269,805
D6—	16	269,742	D7—	337	269,758		157	269,774		64	269,790		127	269,806
	31	269,743	D8—	382	269,760		192	269,775		77	269,791		139	269,807
	56	269,744		388	269,759		204	269,776	D21—	101	269,792		146	269,808

	151	269,809												
D24—	17	269,810												
	34	269,811												
	36	269,812												
	38	269,813												
		269,814												
	45	269,815												
	64	269,816												
D26—	35	269,817												
	73	269,818												
D28—	12	269,819												
	25	269,820												
D30—	42	269,821												
D99—	28	269,822												
		269,823												

CLASSIFICATION OF PLANTS

P.—	9	5,069			5,070		48	5,071		54	5,072			

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

04 : 4,393,519
4,393,520
4,393,583
4,393,596
4,393,599
4,393,602
4,393,692
4,393,975
4,394,258
4,394,352
4,394,532
4,394,678
4,394,728
05 : 4,393,905
4,393,970
06 : Re.31,315
Re.31,318
4,393,526
4,393,527
4,393,528
4,393,531
4,393,541
4,393,568
4,393,575
4,393,593
4,393,600
4,393,612
4,393,628
4,393,636
4,393,649
4,393,654
4,393,662
4,393,663
4,393,668
4,393,706
4,393,708
4,393,711
4,393,727
4,393,730
4,393,757
4,393,758
4,393,765
4,393,808
4,393,816
4,393,817
4,393,828
4,393,830
4,393,868
4,393,871
4,393,884
4,393,896
4,393,906
4,393,923
4,393,926
4,393,928
4,393,932
4,393,936
4,393,948
4,393,988
4,393,991
4,393,996
4,393,997
4,394,003
4,394,014
4,394,020
4,394,037
4,394,042
4,394,046
4,394,055
4,394,056
4,394,061
4,394,069
4,394,074
4,394,101
4,394,102
4,394,103
4,394,107
4,394,117
4,394,123
4,394,136
4,394,138
4,394,154
4,394,182
4,394,213
4,394,247
4,394,250
4,394,251
4,394,253
4,394,276
4,394,277
4,394,279
4,394,296
4,394,302
4,394,303
4,394,307
4,394,344
4,394,345
4,394,362
4,394,377
4,394,381
4,394,383
4,394,394
4,394,397
4,394,398
4,394,438
4,394,449
4,394,464
4,394,478
4,394,496
4,394,538
4,394,543
4,394,544
4,394,556
4,394,579
4,394,610
4,394,613
4,394,632
4,394,634
4,394,639
4,394,653
4,394,667
4,394,695
4,394,700
4,394,702
4,394,711
4,394,714
4,394,726
4,394,729
4,394,742
4,394,744
4,394,745
4,394,746
4,394,769
4,394,774
4,394,780
08 : 4,394,051
4,394,572
4,394,575
4,394,665
4,394,671
4,394,682
4,394,693
4,394,734
09 : 4,393,651
4,393,652
4,393,707
4,393,719
4,393,814
4,393,894
4,393,900
4,393,998
4,394,011
4,394,047
4,394,097
4,394,131
4,394,155
4,394,228
4,394,241
4,394,257
4,394,347
4,394,421
4,394,435
4,394,443
4,394,527
4,394,540
4,394,574
4,394,767
10 : 4,393,736
4,394,153
4,394,174
4,394,314
4,394,489
4,394,506
11 : 4,394,624
12 : 4,393,529
4,393,543
4,393,618
4,393,705
4,393,790
4,393,838
4,393,866
4,393,882
4,393,986
4,394,139
4,394,339
4,394,548
4,394,645
4,394,776
13 : 4,393,989
4,394,166
4,394,289
4,394,413
15 : 4,394,374
16 : 4,393,535
4,394,012
4,394,261
17 : Re.31,316
4,393,551
4,393,563
4,393,615
4,393,659
4,393,694
4,393,712
4,393,740
4,393,763
4,393,768
4,393,803
4,393,872
4,393,879
4,393,880
4,393,908
4,393,909
4,393,913
4,393,915
4,393,919
4,393,950
4,394,000
4,394,025
4,394,031
4,394,065
4,394,111
4,394,248
4,394,299
4,394,372
4,394,399
4,394,408
4,394,422
4,394,447
4,394,485
4,394,547
4,394,551
4,394,612
4,394,615
4,394,647
4,394,681
4,394,703
4,394,723
4,394,756
4,394,770
18 : 4,393,524
4,393,530
4,393,688
4,393,695
4,393,751
4,393,789
4,393,809
4,393,825
4,393,963
4,394,019
4,394,096
4,394,192
4,394,220
4,394,313
4,394,341
4,394,349
4,394,417
4,394,444
4,394,450
4,394,507
4,394,510
4,394,535
4,394,545
4,394,553
4,394,555
4,394,595
4,394,707
4,394,722
19 : 4,393,635
4,393,812
4,393,847
4,394,052
20 : 4,393,584
4,393,791
4,393,959
4,394,718
21 : 4,393,643
4,393,885
4,393,888
4,394,143
4,394,147
4,394,216
4,394,390
4,394,564
4,394,565
22 : 4,393,544
4,393,546
4,393,614
4,393,940
4,394,282
4,394,664
24 : 4,393,582
4,393,621
4,393,699
4,393,777
4,393,883
4,393,907
4,394,197
4,394,223
4,394,370
4,394,459
4,394,603
4,394,633
4,394,689
4,394,777
25 : 4,393,604
4,393,622
4,393,631
4,393,632
4,393,634
4,393,834
4,393,860
4,393,949
4,393,954
4,394,009
4,394,018
4,394,028
4,394,084

4,394,149
4,394,179
4,394,219
4,394,226
4,394,304
4,394,439
4,394,448
4,394,458
4,394,479
4,394,519
4,394,628
4,394,635
4,394,640
4,394,649
4,394,651
4,394,658
4,394,688
4,394,736
26 : 4,393,616
4,393,617
4,393,619
4,393,696
4,393,729
4,393,731
4,393,734
4,393,754
4,393,820
4,393,845
4,393,873
4,393,964
4,393,994
4,393,999
4,394,001
4,394,033
4,394,034
4,394,044
4,394,091
4,394,100
4,394,124
4,394,133
4,394,236
4,394,272
4,394,288
4,394,317
4,394,351
4,394,486
4,394,491
4,394,517
4,394,607
4,394,638
4,394,672
4,394,706
27 : 4,393,534
4,393,538
4,393,674
4,393,804
4,393,851
4,393,901
4,393,921
4,394,010
4,394,029
4,394,070
4,394,094
4,394,403
4,394,433
4,394,434
4,394,571
4,394,580
4,394,708
4,394,727

4,394,732
4,394,733
4,394,761
29 : Re.31,312
4,393,537
4,393,761
4,393,881
4,393,945
4,394,002
4,394,049
4,394,106
4,394,108
4,394,195
4,394,246
4,394,562
4,394,563
4,394,740
31 : 4,393,723
4,394,004
4,394,013
4,394,373
32 : 4,393,861
4,393,927
4,394,368
33 : 4,394,451
4,394,650
34 : Re.31,319
4,393,548
4,393,549
4,393,572
4,393,588
4,393,611
4,393,690
4,393,746
4,393,780
4,393,783
4,393,796
4,393,797
4,393,864
4,393,875
4,393,917
4,394,006
4,394,135
4,394,146
4,394,183
4,394,237
4,394,249
4,394,278
4,394,281
4,394,285
4,394,295
4,394,300
4,394,308
4,394,311
4,394,361
4,394,369
4,394,396
4,394,445
4,394,460
4,394,468
4,394,471
4,394,498
4,394,514
4,394,529
4,394,534
4,394,597
4,394,620
4,394,629
4,394,644
4,394,655

4,394,679
4,394,743
4,394,757
4,394,773
35 : 4,394,622
4,394,623
36 : 4,393,539
4,393,552
4,393,578
4,393,660
4,393,661
4,393,769
4,393,802
4,393,810
4,393,852
4,393,857
4,393,862
4,393,867
4,393,911
4,393,965
4,393,967
4,394,058
4,394,066
4,394,072
4,394,076
4,394,083
4,394,086
4,394,099
4,394,116
4,394,137
4,394,171
4,394,178
4,394,214
4,394,266
4,394,318
4,394,330
4,394,378
4,394,393
4,394,406
4,394,410
4,394,424
4,394,428
4,394,429
4,394,430
4,394,440
4,394,453
4,394,467
4,394,469
4,394,493
4,394,508
4,394,541
4,394,549
4,394,578
4,394,588
4,394,630
4,394,660
4,394,673
4,394,675
4,394,692
4,394,712
4,394,716
4,394,719
4,394,731
4,394,751
4,394,766
37 : 4,393,624
4,393,717
4,394,208
4,394,235
4,394,286

4,394,414
4,394,442
4,394,621
38 : 4,393,969
39 : Re.31,314
4,393,587
4,393,594
4,393,626
4,393,633
4,393,787
4,393,792
4,393,859
4,393,977
4,393,978
4,394,005
4,394,017
4,394,060
4,394,112
4,394,122
4,394,148
4,394,161
4,394,271
4,394,287
4,394,305
4,394,325
4,394,328
4,394,332
4,394,466
4,394,476
4,394,481
4,394,482
4,394,490
4,394,528
4,394,611
4,394,643
4,394,648
40 : 4,393,603
4,393,630
4,393,933
4,393,939
4,393,972
4,394,090
4,394,255
4,394,256
4,394,291
4,394,297
4,394,298
4,394,301
4,394,323
4,394,324
4,394,350
4,394,573
4,394,577
41 : 4,393,521
4,393,595
4,393,741
4,393,925
4,394,038
4,394,656
42 : 4,393,522
4,393,564
4,393,580
4,393,581
4,393,613
4,393,644
4,393,664
4,393,680
4,393,684
4,393,753
4,393,782

4,393,863
4,393,877
4,393,957
4,393,973
4,393,976
4,394,027
4,394,040
4,394,045
4,394,059
4,394,064
4,394,075
4,394,098
4,394,128
4,394,132
4,394,134
4,394,142
4,394,160
4,394,184
4,394,185
4,394,202
4,394,205
4,394,212
4,394,229
4,394,240
4,394,242
4,394,262
4,394,316
4,394,322
4,394,354
4,394,385
4,394,386
4,394,388
4,394,418
4,394,475
4,394,504
4,394,524
4,394,525
4,394,526
4,394,592
4,394,602
4,394,614
4,394,631
4,394,705
4,394,709
4,394,710
4,394,724
44 : 4,393,701
45 : 4,393,562
4,393,725
4,393,739
4,394,057
4,394,126
46 : 4,393,853
47 : 4,393,559
4,393,627
4,393,793
4,393,914
4,394,269
4,394,676
48 : Re.31,313
4,393,536
4,393,569
4,393,598
4,393,610
4,393,666
4,393,722
4,393,829
4,393,889
4,393,893
4,393,929

4,393,930
4,393,931
4,393,934
4,393,935
4,393,937
4,393,938
4,393,946
4,393,971
4,394,023
4,394,140
4,394,189
4,394,194
4,394,254
4,394,273
4,394,283
4,394,284
4,394,321
4,394,326
4,394,355
4,394,367
4,394,455
4,394,461
4,394,463
4,394,474
4,394,497
4,394,587
4,394,616
4,394,748
49 : 4,393,665
4,394,199
4,394,329
4,394,642
50 : 4,393,941
4,394,419
4,394,437
51 : 4,393,601
4,393,716
4,393,745
4,393,800
4,394,089
4,394,204
4,394,230
4,394,268
4,394,389
4,394,500
4,394,617
53 : 4,393,987
4,394,022
4,394,206
4,394,252
4,394,259
4,394,405
4,394,409
4,394,552
54 : 4,393,565
4,394,522
4,394,523
55 : 4,393,637
4,393,645
4,393,744
4,393,848
4,393,878
4,393,895
4,393,960
4,394,026
4,394,473
4,394,530
4,394,561
4,394,608

DESIGN PATENTS

06 : 269,746
269,763
269,764
269,765
269,771
269,782
269,787
269,793
269,794
269,795
269,813
269,814
269,818
08 : 269,749

269,770
269,821
09 : 269,767
269,802
269,817
13 : 269,729
17 : 269,759
269,772
269,784
269,803
269,815
18 : 269,777
19 : 269,751
269,797

20 : 269,798
25 : 269,773
269,801
26 : 269,735
269,776
269,783
269,816
27 : 269,768
269,808
34 : 269,736
269,737
269,738
269,739
269,740

269,741
269,750
269,752
269,766
269,781
36 : 269,730
269,733
269,754
269,769
269,790
269,811
269,744
269,747

269,791
269,807
40 : 269,755
269,799
269,800
269,805
41 : 269,792
269,796
44 : 269,778
269,812
47 : 269,745
48 : 269,758
269,775

269,785
269,788
269,809
269,822
269,823
49 : 269,789
50 : 269,732
269,806
51 : 269,779
53 : 269,810
55 : 269,742
269,756
269,757

PLANT PATENTS

06 : 5,069

5,070

5,071

12 : 5,072

U.S. GOVERNMENT PRINTING OFFICE : O—1983

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402